

FEB 22 2000



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February 18, 2000

Mr. Tim Cropley
Agency of Natural Resources
Department of Environmental Conservation
Waste Management Division
103 South Main Street/West Office
Waterbury, Vermont 05671-0404

Re: Johnson & Dix Bulk Storage Facility - Barre, VT
DH 4090058
SMS Site #99-2683

Dear Mr. Cropley:

Please find attached one (1) copy of our Site Investigation report for the above referenced site. Feel free to contact us if you have any questions or need additional information.

Sincerely yours,

DUFRESNE-HENRY, INC.

A handwritten signature in black ink, appearing to read 'Bruce H. Cox'.

Bruce H. Cox, P.E.
Environmental Services Division

BHC/dim
Enclosure

c: Neil Martin, Johnson & Dix

C:\WP8\Wpdocs\J&D\Barre1.ltr

Phase (check one)	Type (check one)
<input checked="" type="checkbox"/> Site Investigation <input type="checkbox"/> Corrective Action Feasibility Investigation <input type="checkbox"/> Corrective Action Plan <input type="checkbox"/> Corrective Action Summary Report <input type="checkbox"/> Operations & Monitoring Report	<input type="checkbox"/> Work Scope <input checked="" type="checkbox"/> Technical Report <input type="checkbox"/> PCF Reimbursement Request <input type="checkbox"/> General Correspondence

SITE INVESTIGATION

**Johnson & Dix Fuel Corporation
Bulk Storage Facility
Barre, VT 05641**

SMS Site #99-2683

**A Facility Owned By:
Johnson & Dix Fuel Corp.
240 Mechanic Street
Lebanon, NH 03776
(802) 885-4547
Contact: Neil Martin**

**Prepared By:
Dufresne-Henry, Inc.
Precision Park
North Springfield, VT 05150
(802) 886-2261
Contact: F. David Deane, P.E.**

February 18, 2000

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EXECUTIVE SUMMARY

An initial Site Investigation has been completed at the Johnson & Dix Fuel Corporation Bulk Storage Facility in Barre, Vermont. The investigation was conducted by Johnson & Dix in response to subsurface contamination discovered during the cleanup of an unrelated spill on August 30, 1999.

Four groundwater monitoring wells were installed in test borings completed on the site on January 5, 2000. One well was located upgradient of the tank farm near the public use fuel dispenser. Two of the wells were located in the general vicinity of the August 1999 spill, and one at the north (downgradient) end of the tank farm. Soil samples were screened with a PID in the field and detailed boring logs were kept of the drilling activities.

Groundwater samples were obtained from all of the monitoring wells and analyzed for the presence of volatile organic hydrocarbons (VOC's) by EPA Method 8021B. Petroleum compounds were found in the two wells within the confines of the tank farm. At both locations the concentrations of Benzene, 1,2,4-Trimethylbenzene, 1,3,5-Trimethylbenzene, and Naphthalene exceeded their respective VGES. No compounds above method detection limits were found in the other two monitoring wells. The results suggest that the limits of contamination are likely to be confined to the vicinity of the tank farm.

The direction of groundwater flow, based on one round of sounding, is inconclusive. The immediately adjacent Stevens Branch was at a high stage from recent precipitation. The long-term flow direction is likely to be to the west or northwest toward the stream. The on-site building and other nearby properties are on the municipal water supply system. The City reservoirs will not be effected by the release. There are no buildings in the downgradient direction. There have been no reports of petroleum vapors in the on-site office/warehouse building.

Based on these findings the site does not meet the SMS criteria for corrective actions. It is recommended that:

1. The monitoring wells be sampled one (1) time for PAH's or TPH to determine if products other than gasoline are present and to establish baseline concentrations.
1. The monitoring wells be sampled on a semi-annual basis in the spring and fall of the year for VOC's.
2. The required streambank sampling be completed in the spring of 2000 after the snow has melted and the river is at a lower stage.

**SITE INVESTIGATION
JOHNSON & DIX BULK STORAGE FACILITY
BARRE, VERMONT**

Introduction

The Johnson & Dix Bulk Storage Facility is located on North Main Street in Barre, Vermont. A site location map is included as Appendix A and a site sketch is included as Appendix B.

On August 30, 1999 approximately 60 gallons of #2 fuel oil was spilled during a delivery. A cleanup was conducted by Response Environmental, Inc. that day. Personnel from the Vermont Waste Management Division inspected the site on the same day. The State representative confirmed that all of the soil contaminated by the spill had been removed, but that soil below a compromised sheet plastic barrier (at 8"±) was contaminated. The odor noted was that of gasoline. PID readings of 200 ppm or more were observed.

Based on the observations and work summarized above, the Sites Management Section (SMS) requested that a Site Investigation be completed in a letter dated October 14, 1999.

Work and Health and Safety Plans

In response to the SMS letter noted above, Dufresne-Henry prepared a work plan to complete the requested activities. The work plan was forwarded to the SMS on December 3, 1999 and approved via a letter dated December 10, 1999. In that letter the SMS requested that the shoreline of the Stevens Branch be inspected for the presence of petroleum, and that hand augered soil borings be performed with VOC screening using a PID. A site specific Health and Safety Plan was prepared. A copy of these documents will be found in Appendix C.

Site Description

The Johnson & Dix Bulk Storage facility is located on the west side of North Main Street

(US Route 302). The site consists of four (4) 15,000 gallon horizontal aboveground storage tanks (AST's), three (3) 19,000 gallon vertical AST's, and two (2) 275 gallon AST's. Products stored are gasoline, diesel fuel, kerosene, and #2 heating oil. The tanks are surrounded on three sides by a containment dike. Railroad tracks and Route 302 to the east are at a higher elevation, and constitute the remaining side of the containment. Other structures on the property include a building used for office, storage, and shop areas; and a dispenser island for use by the public. Active railroad tracks are located between Route 302 and the facility. The parking lot is bituminous concrete. The building is served by the municipal water supply and wastewater systems.

Surrounding property includes Willey Street to the north, Route 302 to the east, commercial property to the south, and the Stevens Branch of the Winooski River to the west. The western containment dike abuts the streambank. Route 302 is several feet higher than the remainder of the site, which is generally flat. Surface water runoff is in the general direction of the tank farm.

Site History

The history of the site is incompletely known. No detailed accounting of the site history was undertaken as a part of this investigation. The site is believed to have been used for petroleum storage for many years. An aerial photo from April 1963 shows a facility with a very similar layout. The site has likely had periodic upgrades over the years.

The Fourth Quarter 1999 Update (January 14, 2000) Vermont Hazardous Waste Sites List maintained by the Hazardous Materials Management Division (HMMMD) contains twenty (20) sites in Barre City (including the subject property) and six (6) sites in Barre Town. Six (6) of the sites appear to be within a one-half mile radius of the subject property.

The sites are Safety-Kleen (SMS #777-0095), VT Morgan (SMS #80-0030), Atlantic (SMS #91-1064), Rossi Trucking (SMS #91-1065), Bellevance (SMS #91-1078), and RJ Citgo (SMS 394-1682). All of the sites, with the exception of Rossi and Bellevance, are in the Site Monitoring Phase. Although requested, no work is in progress on those two sites. None of these sites are expected to have an impact on the subject property.

Previous Work/Investigations

On August 30, 1999 an estimated 30 gallons to 60 gallons of #2 fuel oil were spilled during a bulk delivery. The spill was on an unpaved area under the AST's. The impacted area was approximately 6' by 20'. Johnson & Dix contacted Response Environmental, Inc (REI) to conduct cleanup operations. REI pumped approximately 20 gallons of ponded product into a drum. Approximately 1.25 cubic yards of contaminated soil were excavated and drummed. REI indicated the oil had saturated only the upper 4"± of the 8"± of soil over a polyethylene sheet liner. The drums were removed from the site under manifest.

Mr. Ted Unkles of the Vermont Waste Management Division (WMD) was on site the day of the occurrence, and after REI had completed the cleanup. The release was assigned Spill File #99-288. Mr. Unkles observations were summarized in the Introduction. Because of evidence of a nonrelated release below the liner Mr. Unkles recommended an investigation to determine the degree and extent of subsurface contamination. A copy of the REI and WMD reports are included as Appendix D.

With the exception of the work summarized above, no record of previous studies at the site was disclosed.

Monitoring Well Installation

Four (4) groundwater monitoring wells were installed in soil borings on January 5, 2000 by M & W Soils Engineering, Inc. of Charlestown, New Hampshire. All borings and well installations were under the field observation of Dufresne-Henry personnel. The monitoring wells are designated MW-1 through MW-4. Locations are shown on the Site Plan included as Appendix B. The drillers boring logs, and DH logs and daily report are included as Appendix E.

Well MW-1 is located at the south end of the public use fuel pump island. MW-2 is located at the north end of the AST's. MW-3 is located in the area of the spill between the vertical and horizontal AST's. MW-4 is located just west of the electric junction box between tanks #4 and #5. Due to tight site conditions, MW-3 and MW-4 were completed using a portable tripod rig.

During boring advancement continuous split spoon soil samples were taken starting at 3' in MW-1, 5' in MW-2, 1.5' in MW-3, and 1' in MW-4. The upper 18" - 24" was frozen. All soil samples were screened for the presence of Volatile Organic Compounds (VOC's) with a Photovac HL-2000 photoionization detector (10.6 eV lamp, calibrated on-site with 101 ppm Isobutylene). The screening was done in the headspace of the unwarmed sample jars in a heated vehicle.

No evidence of contamination by visual or olfactory senses was observed in MW-1 or MW-2. Peak PID readings ranged from 0.3 ppm to 8.8 ppm in MW-1 and were 0.0 ppm in MW-2. Soil with an oily or oily gasoline odor was observed in MW-3 and MW-4. In MW-3 contamination was observed between 1.5' and 13'+ accompanied by peak PID readings ranging from 7.4 ppm to 1,540 ppm. In MW-4 contamination was observed between 1' and 12'+ with peak PID readings ranging from 3.2 ppm to 1,220 ppm. Several of the soil samples were obviously stained and/or had an oily sheen. In MW-4 a dense till layer was encountered below 15'. No odors were observed in this soil. No soil samples were retained for laboratory analysis.

Site soils consist of up to 5' of sandy gravel fill, underlain by silty sand and sandy silt to approximately 15' where a dense silty till was encountered. The fill layer appears to contain variable quantities of cobble and boulder size granite rubble. Bedrock was not encountered at any location.

Two-inch diameter PVC monitoring wells were installed in the borings at MW-1 and MW-2. Each well was constructed from 0.010" machine slotted screen. The screened interval is 10' at both locations. The wells in MW-3 and MW-4 were constructed from 1" diameter, hand slotted, galvanized steel pipe. The slotted interval was 10' at both locations. Each well was backfilled with clean silica sand to a point above the screen and a bentonite seal installed. At MW-1 and MW-2 the wells were protected at the ground surface by grouting in watertight cast iron monitoring well boxes. At MW-3 and MW-4 the pipes extend approximately 1.5' above the surface, with bentonite seals from the top of the sand to ground level.

Monitoring Well Sampling

All of the monitoring wells were sounded and sampled on January 12, 2000 following our standard protocols. Three well volumes were purged prior to drawing a sample. MW-1 and

MW-2 were purged and sampled with disposable polyethylene bailers. MW-3 and MW-4 were purged and sampled using a peristaltic pump. Heavy sheens were noted on the water evacuated from MW-3 and MW-4. Purged water from those wells was poured into a drum that was used during the cleanup in August 1999. The refrigerated samples were shipped to Eastern Analytical, Inc. via overnight carrier on the same day they were obtained for VOC analysis by EPA Method 8021B, modified to include Trimethylbenzenes and Naphthalene.

Compounds above method detection limits were found in MW-3 and MW-4, the wells located in the vicinity of the release. In both of those wells the concentrations of Benzene, 1,2,4-Trimethylbenzene, 1,3,5-Trimethylbenzene, and Naphthalene were above their respective VGES. No compounds above method detection limits were found in MW-1 or MW-2. The compounds and concentrations suggest gasoline as the prevalent pollutant. Oily odors were observed in the soil samples, but without PAH results it is not known if heavier oils are also present in the groundwater. The results are summarized in the table below. The laboratory report and sampling documentation are included in Appendix F.

TABLE 1
SUMMARY OF GROUNDWATER RESULTS - JANUARY 2000

Compound	VGES μg/l	MW-1 μg/l	MW-2 μg/l	MW-3 μg/l	MW-4 μg/l
Benzene	5	<1	<1	10	70
Toluene	1,000	<1	<1	90	150
Ethylbenzene	700	<1	<1	50	80
Total Xylenes	10,000	<1	<1	360	590
1,2,4-Trimethylbenzene	5	<1	<1	240	460
1,3,5-Trimethylbenzene	4	<1	<1	110	170
Naphthalene	20	<5	<5	200	100
MTBE	40	<10	<10	<100	<100
Dilution Factor	—	1	1	10	10

Concentrations in **bold** exceed the Vermont Groundwater Enforcement Standard.

As noted in the form above the dilution factor for MW-3 and MW-4 was 10, resulting

in a reported detection limit of 100 $\mu\text{g/l}$ for MTBE. We requested that Eastern Analytical reexamine the data for those samples and make a determination whether MTBE was present. Their best estimate is that MTBE is present in MW-4 at approximately 40 $\mu\text{g/l}$. No MTBE was seen in MW-3. The presence of MTBE is evidence that some of the contamination is of relatively recent vintage.

Streambank Sampling

In approving the Dufresne-Henry work plan, the SMS also requested that the shoreline of the Stevens Branch be inspected for the presence of petroleum, and that hand augered soil borings be performed with VOC screening using a PID. At the time of the test borings there was approximately 18" of frost in the ground, the ground was obstructed with a thin snow cover, and the Stevens Branch was flowing at a high level. Discussions with Mr. Tim Cropley and Mr. Andrew Shively of the SMS, who were on-site in the afternoon, indicated that this work could be delayed until spring.

Site Geology

Surficial geology at the site is published as recent alluvium. The sites proximity to the Stevens Branch and the silty sand and sandy silt observed during the test borings generally corroborate the mapping. Dense silty till was found at a depth of approximately 15 feet. The upper 5 \pm feet of the site has been filled. Although fine grained, the upper site soils have moderate permeability. The monitoring wells were not dewatered during the presample purging. The underlying till is likely to be relatively impermeable.

Published mapping indicates bedrock at the site is the Barton River member of the Waits River Formation. The Waits River is generally described as gray quartzose and micaceous crystalline limestone, interbedded and intergradational with gray quartz-muscovite phyllite or schist. The Barton River is similar, but contains beds of sericite-quartz-chlorite phyllite. The formation is Lower Devonian in age. Some fracturing is likely. Bedrock was not encountered in the borings.

Site Hydrogeology

All of the monitoring wells were sounded on January 12, 2000. The depth to the water table ranged from approximately 6.3 feet in MW-3 to approximately 9.8 feet in MW-2. The direction of groundwater flow is inconclusive based on the one sounding round. The immediately adjacent Stevens Branch was flowing at a high stage, and had likely risen sharply in response to earlier precipitation. The long-term flow direction is expected to be to the west or northwest toward the stream. Additional sounding rounds will be needed to ascertain this.

Potential Receptors

The ultimate receptor of groundwater discharging from this site is the Stevens Branch which at its nearest point is less than 30 feet from the tank farm. The Johnson & Dix building is believed to have a slab on grade foundation. There are no structures between the probable limits of contamination and the stream. The parking areas are paved. All of the buildings in the vicinity are on the municipal water supply system. The Barre reservoirs are far removed from the subject property and at higher elevations.

Summary and Recommendations

An initial Site Investigation has been completed at the Johnson & Dix Fuel Corporation Bulk Storage Facility in Barre, Vermont. The investigation was conducted in response to the discovery of contaminated soil during the cleanup of a spill in August 1999. The contaminated soil was not related to the spill.

Four groundwater monitoring wells were installed in test borings completed on the site on January 5, 2000. Groundwater samples were obtained from all of the monitoring wells and analyzed for the presence of volatile organic hydrocarbons (VOC's) by EPA Method 8021B. Compounds above method detection limits were found in MW-3 and MW-4, the wells within the confines of the tank farm. At both locations the concentrations of Benzene, 1,2,4-Trimethylbenzene, 1,3,5-Trimethylbenzene, and Naphthalene exceeded their respective VGES. No compounds above method detection limits were found in MW-1 or MW-2. The results suggest that the limits of contamination are likely to be confined to the vicinity of the tank farm.

Given the proximity of the Stevens Branch, impacts to it are possible.

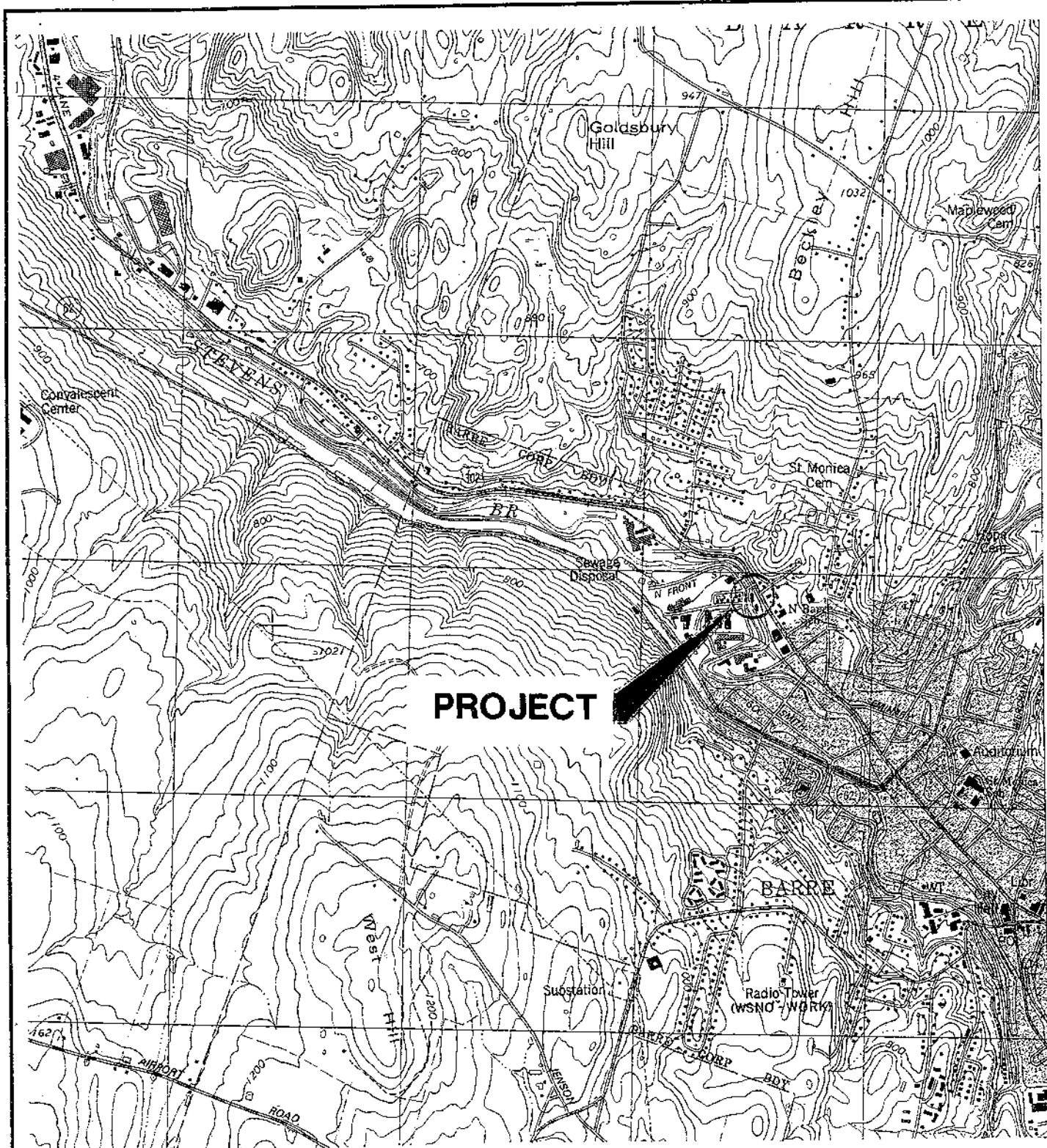
The long-term direction of groundwater flow is expected to be to the west and northwest toward the Stevens Branch.

The ultimate receptor of groundwater discharging from this site is the Stevens Branch which is less than 30 feet from the tank farm. The on-site building and all other properties in the vicinity are on the municipal water supply system. The municipal supply is approximately 5 miles away and at a higher elevation. There are no downgradient buildings between the tank farm and the river. There have been no reports of petroleum vapors in the on-site office/warehouse.

Based on these findings the site does not meet the SMS criteria for additional corrective actions. It is recommended that:

1. The monitoring wells be sampled one (1) time for PAH's or TPH to determine if products other than gasoline are present and to establish baseline concentrations.
2. The monitoring wells be sampled on a semi-annual basis in the spring and fall of the year for VOC's.
2. The required streambank sampling be completed in the spring of 2000 after the snow has melted and the river is at a lower stage.

APPENDIX A
SITE LOCATION MAP



PROJECT

SCALE
1:24,000

TAKEN FROM A QUADRANGLE MAP FOR BARRE WEST, VT
PHOTOREVISED 1988

DH
Dufresne-Henry
North Springfield, Vermont
Tel. (802)886-2261
www.dufresne-henry.com

**SITE LOCATION PLAN
FOR**
**JOHNSON & DIX FUEL CORPORATION
BULK STORAGE FACILITY**

BARRE,

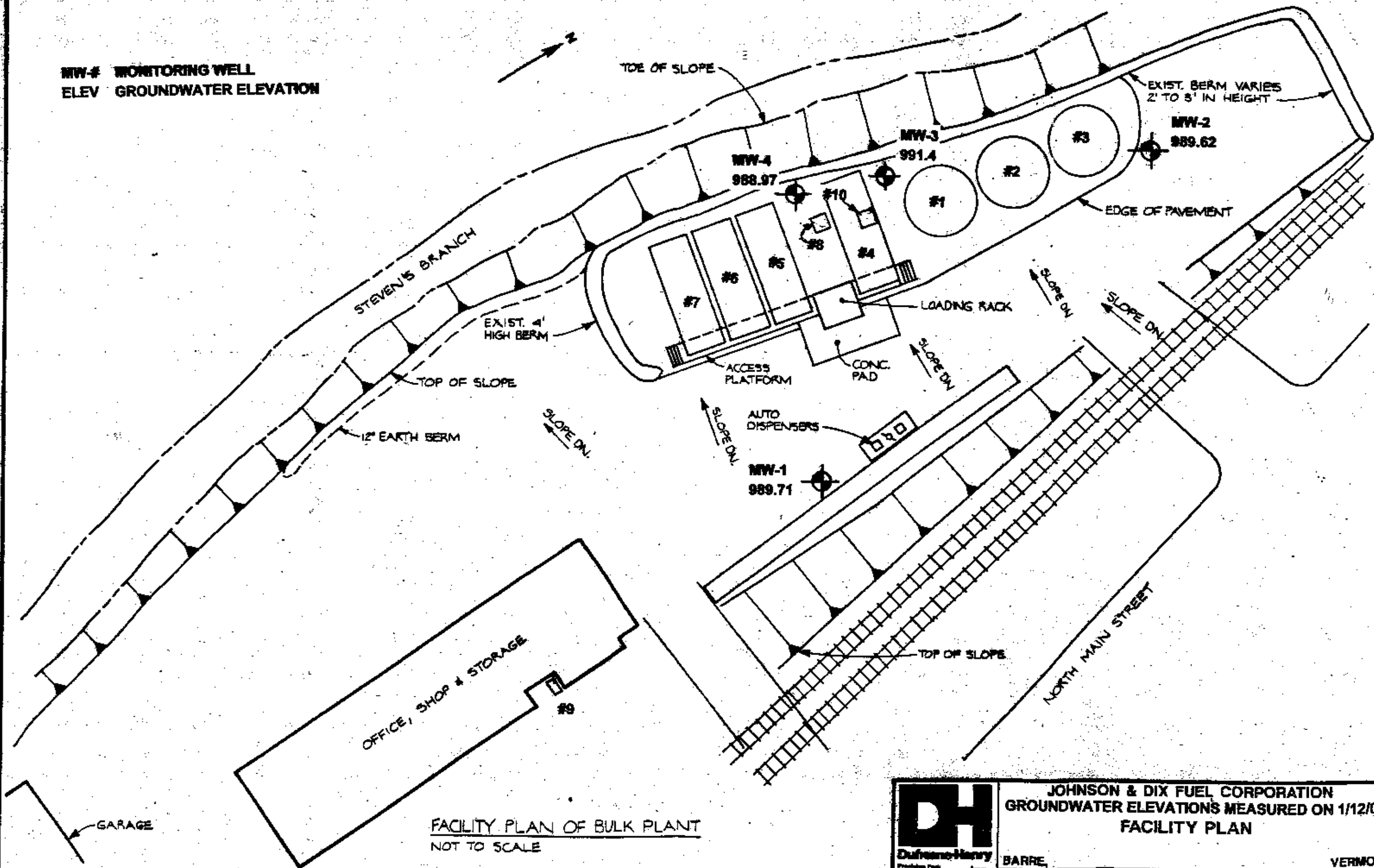
VERMONT

Project No.	4090058
Proj. Mgr.	F.D.D.
Scale	1:24,000
Date	FEB., 2000
A	SLP-1

APPENDIX B

SITE AND GROUNDWATER ELEVATION PLAN

MW-# MONITORING WELL
ELEV GROUNDWATER ELEVATION



FACILITY PLAN OF BULK PLANT
NOT TO SCALE



JOHNSON & DIX FUEL CORPORATION
GROUNDWATER ELEVATIONS MEASURED ON 1/12/00
FACILITY PLAN

BARRE,

VERMONT

Proj. Mgr. F.D.D. Date 2/00 8

APPENDIX C

WORK PLAN, HEALTH AND SAFETY PLAN

Proposed Work Plan
Site Investigation

**JOHNSON & DIX FUEL CORPORATION
BULK STORAGE FACILITY
BARRE, VERMONT
SMS #99-2683**

This work plan outlines the tasks to be completed for a Site Investigation at the Johnson & Dix Bulk Storage Facility in Barre, Vermont. This plan has been prepared as a result of a request from the Sites Management Section dated October 14, 1999. Approximately 60 gallons of #2 fuel oil were spilled at the site on August 30, 1999. A follow up investigation by Waste Management Division personnel on the same day confirmed that contaminated soil down to a plastic liner had been removed, and that the oil had not reached the nearby Stevens Branch. The WMD inspection found the liner to be in poor condition, with weathered gasoline odors observed from the underlying material (granite tailings) and PID readings up to 200 ppm.

The purpose of the investigation is to determine the existence and extent of subsurface petroleum contamination at the site. The proposed monitoring wells will be used to help ascertain the extent of a contamination plume and provide basic hydrogeologic data. At this time it is anticipated that four (4) shallow groundwater monitoring wells will be installed on the site. The wells will be arrayed such that one is in the presumed upgradient direction, two are just to the north and south of the release site, and one is in the downgradient direction relative to the flow of the Stevens Branch. A site sketch showing the proposed locations is attached. All field personnel are OSHA certified for hazardous site operations under 29 CFR part 1910.120.

BORINGS

The site has been visited by both Dufresne-Henry personnel and the drilling contractor. The site of the release presents very difficult working conditions due to above ground piping, the AST's, and their associated structural supports. Two of the borings, B-2 and B-4 on the sketch can be completed using a truck mounted rig. It is possible that B-1 can be done with the truck. An attempt will be made to complete B-3 using a portable tripod rig. The success in this location will be dictated by the available room to erect the rig and how difficult it is to penetrate the granite tailings. This boring will be advanced by driving and washing casing. To improve the chances for success it is likely that a well of 1 1/2" diameter or less will be installed. The presence of the granite tailings means wash water returns are unlikely. Any wash water that is returned will be recycled to minimize the disposal volume.

At the truck accessible locations it is anticipated that the borings for the monitoring wells will be completed using 4 1/4" hollow stem augers. If possible, monitoring well borings will be taken a minimum of five (5) feet into the prevailing water table. It is anticipated that well depth will not exceed 20 feet. Petroleum based pipe dope for use on drill rods, tools, or casing will not be allowed. No type of drilling mud, including polymers, will be used. Should flowing sands be

encountered, clean water obtained locally will be used to increase hydraulic head. If flowing sands are particularly problematic, casing will be used. All borings and monitoring well installations will be performed by M & W Soils Engineering, Inc. of Charlestown, New Hampshire under the field observation of Dufresne-Henry personnel. Due to the difficult site conditions and the labor intensive nature of tripod work, two days have been carried in the cost estimate to complete the borings and well installations.

SOIL SAMPLING

To determine the vertical profile of any contaminant plume, continuous split spoon sampling is proposed for each boring completed with the truck mounted rig. Sampling at other intervals may occur and will be a field decision of the Dufresne-Henry inspector. The split spoon sampler allows retrieval of relatively undisturbed soil samples from a known depth for classification and Volatile Organic Compound (VOC) screening. All soil samples and material from the auger flights will be screened for VOC's by headspace analysis with a Photovac HL-2000 photoionization detector (10.6 eV lamp, calibrated with Isobutylene). The act of driving the sampler (Standard Penetration Test) also gives an indication of the density or degree of compaction of the soil. Representative samples from each spoon will be placed in glass jars and retained by Dufresne-Henry. These are for project records only and are not intended for chemical analysis. Detailed logs of geology, drilling data, PID readings, and monitoring well installation will be prepared for each boring. At this time it is not anticipated that analytical soil samples will be collected.

MONITORING WELLS

Monitoring wells in the borings completed with the truck mounted rig will be constructed from 2" diameter, 0.010" machine slotted, threaded, flush joint, Schedule 40 PVC. The well diameter in the tripod completed borings will be determined by the size casing that can be advanced. Assuming no refusal, each monitoring well will consist of 10' to 15' of screen with sufficient riser to reach approximately 2" below the surface grade. The bottom of the well will be set such that approximately 5 feet of screen extends below the water table observed at the time of installation. For wells with shallow depth to the water table, the screened interval will be a decision of the Dufresne-Henry inspector. The bottom of all wells will be provided with a PVC cap or point, or a plug with an expanding gasket. The annular space between the auger and the screen will be carefully backfilled with clean silica sand to create a filter pack around the well. The filter pack will extend from the bottom of the well to approximately 2 feet above the screen. A bentonite seal will be installed above the filter pack, and the remainder of the hole will be backfilled with native soil. A protective monitoring well box will be grouted in flush at the surface or a stick-up steel casing installed depending on the location. All wells will have removable top caps for sampling and sounding.

DECONTAMINATION

The borings may, or may not, be completed within the zone of contamination. However, to prevent cross contamination between the borings, strict decontamination procedures will be followed. All in-ground tools and equipment will be decontaminated by steam cleaning prior to the start of work and between borings. All decontamination will be done on-site at a designated location. Within the known contaminated area, routine cleaning of equipment, such as split spoons, will use water obtained at the site and a product such as ALCONOX. Disposal of spent cleaning solution will be at the site. Excess contaminated soil and wash water will be drummed on site.

WATER SAMPLING

Water quality samples will be obtained from the Dufresne-Henry installed monitoring wells following a period of stabilization. The samples will be taken by Dufresne-Henry personnel. Samples from the 2" wells will be obtained with disposable bailers which will be left in the wells to facilitate future sampling. Samples from 1" or less wells will be obtained with a peristaltic pump. Samples may not be obtained from any well exhibiting free product. All of the monitoring wells will be analyzed for VOC's by EPA Method 8021B (modified to include MTBE, Naphthalene, and Trimethylbenzenes) by Eastern Analytical, Inc. of Concord, New Hampshire.

SITE SURVEY

The relative locations and elevations of the monitoring wells will be determined. Sufficient additional surveying will be performed to update any existing site plan or prepare a new site plan.

RECEPTOR ASSESSMENT

A receptor assessment will be conducted to identify potential receptors including nearby water supply wells and surface water. The basements of any nearby buildings, if any, will be screened with the PID as deemed necessary. If any identified water supplies appear to be at risk, they will be sampled and analyzed as noted above.

REPORTING

A report will be prepared summarizing the findings and recommendations of the investigation including the monitoring well installation, groundwater quality and overall characterization of shallow subsurface conditions, and the likely impacts on potential receptors. Conclusions and recommendations regarding the need for long term treatment and/or monitoring will be included. The report will be submitted within 45 days of the monitoring well installation.

A summary breakdown of estimated costs to complete the work will be found attached.



State of Vermont

Department of Fish and Wildlife
Department of Forests, Parks and Recreation
Department of Environmental Conservation
State Geologist
RELAY SERVICE FOR THE HEARING IMPAIRED
1-800-253-0191 TDD-Voice
1-800-253-0195 Voice-TDD

AGENCY OF NATURAL RESOURCES
Department of Environmental Conservation
Waste Management Division
103 South Main Street/West Office
Waterbury, Vermont 05671-0404
(802) 241-3888
FAX (802) 241-3296

December 10, 1999

RECEIVED

DEC 13 1999

DUFRESNE-HENRY

ATTN DAVID DEANE
DUFRESNE-HENRY INC
PRECISION PARK
NORTH SPRINGFIELD VT 05150

RE: Additional Site Investigation Work Plan/Cost Estimate at Johnson and Dix Bulk Facility Site (#99-2683)
Barre, Vermont

Dear Mr. Deane:

The Vermont Department of Environmental Conservation, Sites Management Section (SMS) has reviewed Dufresne-Henry's (DH's) December 3, 1999, work plan and cost estimate for the installation of four monitoring wells (MWs) at the above referenced site.

The work proposed includes:

- Advancement of four soil borings, completing them as monitoring wells (MWs), and developing as required. In those locations that a drill rig can operate, borings will be advanced using a truck mounted rig. In those areas with limited operating space, boring advancement will be performed using a portable tripod rig. Continuous split spoon sampling and screening with a photoionization detector (PID) will occur at the borings advanced by the truck-mounted rig. Due to the difficulty expected during drilling, two days of field work have been allocated for these activities.
- Sampling of these four MWs and analyzing for volatile organic compounds (VOCs) by EPA Method 8021B.
- Performing a sensitive receptor survey.
- Submitting a summary report to the SMS which includes all relevant site information and observations, boring/well logs, groundwater data, an updated site map, water table map, a contaminant isoconcentration map, conclusions, and recommendations for any additional site work and monitoring.

Additionally, the SMS requests the following:

- 1) Inspect the shoreline of the Steven's Branch for visual and olfactory evidence of petroleum sheens; and

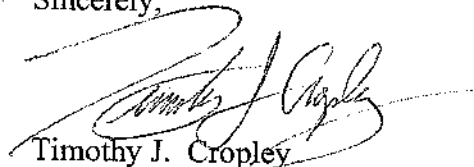
- 2) Advance hand augured soil borings at various downgradient locations between the bulk plant and the river and screen the soil for VOCs with a PID. If evidence is found of petroleum contamination, soil samples will be collected at the discretion of the on-site project manager. If collected, soil samples will be analyzed by EPA Method 8021B.

The SMS approves of DH performing this work at the Petroleum Cleanup Fund reimbursable amount of \$7,690 (not including the additional work requested above), and the work should commence as soon as practical. The SMS should be informed when this work is scheduled for.

The ASTs at the Johnson and Dix Bulk Facility in Barre, Vermont are covered by the Petroleum Cleanup Fund (PCF) as set forth in 10 V.S.A. Section 1941 as long as no private insurance exists which would apply to this situation. You must provide proof of no insurance before the PCF can be used to reimburse these expenses. An owner or permittee of a tank, who is not in significant violation of his or her permit, is eligible for reimbursement from the fund. If a tank is found to require repair or removal, the owner or permittee must pay for the removal or repair of the failed (or abandoned) tank and for the first \$250 of the cleanup; after that the fund will reimburse the tank owner or permittee for additional cleanup costs up to \$25,000. The fund may not pay for cleanup costs which are for cleanup work that is not pre-approved by the Agency.

If you have any questions or comments, please feel free to contact me by phone at (802) 241-3896, by email at timc@lec.anr.state.vt.us, or in writing at the above address.

Sincerely,



Timothy J. Cropley
Hazardous Materials Specialist

cc: Neil Martin, Johnson and Dix, 240 Mechanic St., Lebanon, NH

TC/tc/sms/992583Johnson&DixWp

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PROJECT: JOHNSON & DIX BULK FACILITY SITE INVESTIGATION
JOB NO.: 4090058

HEALTH AND SAFETY PLAN
FOR

SITE INVESTIGATION

JOHNSON & DIX BULK STORAGE FACILITY

BARRE, VERMONT

This Health and Safety Plan applies only to Dufresne-Henry, Inc. employees.

PROPOSED ON-SITE ACTIVITIES:

Installation of four (4) groundwater monitoring wells, decontamination, and groundwater sampling.

PROPOSED DATE(S) OF WORK: Wells: January 5 - 6, 2000
Sampling: Week of January 10, 2000

ANTICIPATED WEATHER CONDITIONS: temperatures in the singles - 40's, possible snow.

PROPOSED SITE INVESTIGATION TEAM:

<u>Personnel</u>	<u>Responsibilities</u>
F. David Deane	Project Manager
Bruce Cox	Site Safety Officer
Bruce Cox/Oscar Garcia	Field Team Leader (Monitoring Wells/Sampling)
Neil Martin	Site Representative
Tim Cropley	ANR Representative

All Dufresne-Henry, Inc. personnel arriving or departing the Site should check in and out with the Site Safety Officer. All Dufresne-Henry activities on-Site must be cleared through the Field Team Leader or Project Manager.

PROJECT: JOHNSON & DIX BULK FACILITY SITE INVESTIGATION
JOB NO.: 4090058

Background Information

Site Status: ☒ Active ☐ Inactive ☐ Unknown

Site Description (Topography, on-site structures, vegetation, surrounding population, contaminated areas (if known))

The Johnson & Dix Bulk Storage Facility is located on the west side of North Main Street in Barre, VT. On-site utilities are unknown at this time but likely include underground water and sewer lines, underground and overhead power lines, and product piping. The depth to the water table is estimated to be approximately 10 feet.

Dig Safe was contacted on 12/28/99. The site is clear after 8:00 am on 12/30/99. The Dig Safe number is 20000101277. The City of Barre Engineering Department was contacted on January 4, 2000. Plans showing water and sewer can be picked up at their office on the day of work. Johnson & Dix was contacted on January 4, 2000. A representative will be on site to approve boring locations with respect to their power and product lines.

Site History:

The site history is not known at this time. It is expected that the site has been used for petroleum storage for many years. There are ten (1) AST's on site ranging in size from 110 gallons to 19,000 gallons. Products stored are gasoline, kerosene, heating oil, and diesel fuel.

Monitoring or Sampling Data From Previous Site work:

Approximately 60 gallons of #2 heating oil were spilled on August 30, 1999. Contaminated soil was removed down to an existing liner. An inspection by the Vermont Waste Management Division found the liner to be in poor condition with petroleum below it. Weathered gasoline odors and PID readings up to 200 ppm were observed.

No other site investigations are known.

PROJECT: JOHNSON & DIX BULK FACILITY SITE INVESTIGATION
JOB NO.: 4090058

HAZARD REFERENCE

Waste Types:

☒ Liquid ☒ Solid (soil) ☐ Sludge ☒ Vapor ☐ Unknown

Waste Characteristics:

☐ Corrosive ☒ Ignitable ☐ Radioactive
☒ Volatile ☐ Toxic ☐ Reactive
☐ Unknown ☐ Other ☐ Persistent

Specific Substances of Greatest Concern (if known): gasoline, oil

Hazard Evaluation:

Task: Mon. Well Install. ☒ Low ☐ Medium ☐ High

Identification of Hazards: gasoline, oil

Task: Decontamination ☒ Low ☐ Medium ☐ High

Identification of Hazards: gasoline, oil

Task: Sampling ☒ Low ☐ Medium ☐ High

Identification of Hazards: gasoline, oil

Task: ☐ Low ☐ Medium ☐ High

Identification of Hazards:

Other Physical Hazards: (weather, heavy equipment, site structures...)
Drill rig, delivery truck traffic, weather.

PROJECT: JOHNSON & DIX BULK FACILITY SITE INVESTIGATION
JOB NO.: 4090058

Hazard Assessment:

OVERALL HAZARD: ☐ Serious ☐ Moderate ☒ Low ☐ Unknown

On-Site Control

Site control is necessary to minimize potential exposure of workers to hazardous waste/materials, protect the public from the Site's chemical and physical hazards, and to facilitate work activity. The procedures to be followed involve the establishment of Site work zones, Site security, and safe work practices.

The on-Site staging area and support zone has been established at:

The facility parking lot in front of the office.

The personal contamination reduction zone (decon area) has been established at:

The facility parking lot near the loading rack.

During the intrusive work, the exclusion area will be defined as follows:

A 15 foot radius around the drill rig.

The decontamination of sampling and/or heavy equipment will be conducted:

The facility parking lot near the loading rack. Steam cleaning will be done in a drum or other container.

These sub-regions of on-Site control have been established in order to reduce the potential cross contamination and proliferation of contamination by potentially contaminated equipment and personal protective equipment.

PROJECT: JOHNSON & DIX BULK FACILITY SITE INVESTIGATION
JOB NO.: 4090058

SITE ACTIVITIES

Required Personal Protective Equipment (PPE)

<u>Task</u>	<u>Entry Level of Protection</u>	<u>Monitoring Equipment</u>	<u>Upgrade/Downgrade Contingency</u>
Well Install.	Mod D	Photovac HL-2000 Explosimeter O ₂ meter H ₂ S meter	Upgrade to Level C with PID readings over 10 ppm for 5 minutes in breathing space.
Decon.	Mod D	"	"
Sampling	Mod D	"	"

Note: Breathing space PID readings of 50 ppm, explosimeter readings over 25% of the LEL, O₂ deficiency or enrichment, or H₂S readings will result in shutting down the job and consulting with State officials and the client.

PROJECT: JOHNSON & DIX BULK FACILITY SITE INVESTIGATION
JOB NO.: 4090058

Specific protective equipment for each level of protection is as follows:

Level C: Full Face Respirator w/appropriate cartridge (Willson T45)
Chemically Resistant Suit (Tyvek®)
Outer Rubber Slush Boots
Outer Chemically Resistant Gloves
Surgical Gloves
Hard Hat
Steel Toe/Shank Work Boots

Modified Level D: Chemically Resistant Suit (Tyvek®)
Outer Rubber Slush Boots
Outer Chemically Resistant Gloves
Surgical Gloves
Hard Hat
Steel Toe/Shank Work Boots
Safety Glasses or Face Shield

Level D: Work Clothes
Steel Toe/Shank Work Boots
Surgical Gloves
Hard Hat

Rationale for change in level of protection:

Upgrade to Level C with PID readings of 10 ppm or more for 5 minutes in the breathing space. PID readings over 50 ppm in the breathing space, explosimeter readings of over 25% of the LEL, O₂ deficiency or enrichment, or H₂S readings will result in shutting down the job and consulting with State officials and the client.

NO CHANGES TO THE SPECIFIED LEVELS OF PROTECTION SHALL BE MADE WITHOUT THE APPROVAL OF THE SITE SAFETY OFFICER OR PROJECT MANAGER.

Monitoring Procedures

Site Monitoring Equipment:

- ☒ Photovac MicroTIP (Model HL-2000, 10.6 eV lamp)
- ☐ Explosimeter
- ☐ Draeger Tube & Pump
- ☐ O₂ Meter
- ☐ Other: H₂S meter

Methods and Frequency of Monitoring:

Air space and soil samples: Photovac MicroTIP HL-2000.
Air space: explosimeter/O₂ meter/H₂S meter.

Frequency: Soil samples; as obtained.
Air; not to exceed every 15 minutes.

PROJECT: JOHNSON & DIX BULK FACILITY SITE INVESTIGATION
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Decontamination and Disposal

Personnel Decontamination Procedure:

- ☒ Level C: Slush boot and glove wash, slush boot and glove rinse, tape removal, outer glove removal, (cartridge change), slush boot removal, suit removal, inner glove removal.
- ☒ Modified Level D: Slush boot and glove wash, slush boot and glove rinse, slush boot removal, suit removal, glove removal.

Equipment Decontamination:

The drill rig and tools will be decontaminated by steam cleaning prior to the start of work and between borings. The use of clean augers (not previously used on the job) will be permitted with washing of the bit in ALCONOX. All decontamination will be done on-site. Routine washing of split spoon samplers, etc will use water obtained at the site. Disposal of spent cleaning liquid will be on site.

Disposal Procedure for Investigation-Derived Materials: (decon waste, disposables)

All decon waste and disposables will remain on site. Contaminated soil will be drummed on site.

PROJECT: JOHNSON & DIX BULK FACILITY SITE INVESTIGATION
JOB NO.: 4090058

SITE OPERATING PROCEDURES/SAFETY GUIDELINES

- ** Always observe the buddy system. Never enter or exit site alone, and never work alone in an isolated area. Never wander off by yourself.
- ** Always maintain a line-of-sight.
- ** Practice contamination avoidance. Never sit down or kneel, never lay equipment on the ground, avoid obvious sources of contamination such as puddles, and avoid unnecessary contact with on-site objects
- ** No eating, drinking, or smoking outside the designated "clean" zone.
- ** In the event PPE is ripped or torn, work shall stop and PPE shall be removed and replaced as soon as possible.
- ** Be alert to any unusual changes in your own condition; never ignore warning signs. Notify Health and Safety Coordinator as to suspected exposures or accidents.
- ** A vehicle will be readily available exclusively for emergency use. All personnel going on-site shall be familiar with the most direct route to the nearest hospital.
- ** In the event of direct skin contact, the affected area shall be washed immediately with soap and water.
- ** Copies of the Health and Safety Plan shall be readily accessible at the command post.
- ** Note wind direction. Personnel shall remain upwind whenever possible during on-site activities.
- ** Never climb over or under refuse or obstacles. Use safety harness/safety lines when sampling lagoons, stream beds, and ravines with steep banks.
- ** Hands and face must be thoroughly washed before eating, drinking, etc.
- ** Any modifications to this safety plan MUST be approved by the Site Safety Officer.

PROJECT: JOHNSON & DIX BULK FACILITY SITE INVESTIGATION
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Special Procedures:
Confined Space Entry

☒ No attempt will be made to enter abandoned buildings, manholes, tanks, or any other confined areas.

☐ Other:

Personnel Monitoring: (If applicable: Heat stress, frostbite, air sampling of individual breathing zone)

Monitoring of individual breathing space will be monitored by a Photovac MicroTIP HL-2000, explosimeter, and O₂ meter as outlined in monitoring procedures. Monitoring of weather related hazards will be dictated by existing conditions.

EMERGENCY SITUATIONS

The following standard emergency procedures will be used by Dufresne-Henry on-site personnel. The Site Safety Officer (SSO) shall be notified of any on-site emergencies and be responsible for ensuring that the appropriate procedures are followed.

Personnel Injury to Dufresne-Henry Employees in the Exclusion Zone

Upon notification of an injury to a Dufresne-Henry employee in the exclusion zone, a rescue team will enter the zone (if required) to remove the injured person to the hotline. The SSO and Project Manager should evaluate the nature of the injury, and the affected person should be decontaminated to the extent possible prior to movement to the support zone. The SSO shall arrange for appropriate first aid, and contact should be made for an ambulance and with the designated medical facility (if required). No Dufresne-Henry personnel shall re-enter the exclusion zone until the cause of the injury or symptoms are determined.

Personnel Injury to Dufresne-Henry Employees in the Support Zone

Upon notification of an injury to a Dufresne-Henry employee in the support zone, the Project Manager and SSO will assess the nature of the injury. If the cause of the injury or loss of the injured person does not affect the performance of site personnel, operations may continue, with the on-site Field Team Leader initiating the appropriate first aid and necessary follow-up as stated above. If the injury increases the risk to others, all Dufresne-Henry personnel shall move to the decon line for further instructions. Dufresne-Henry activities on-site will cease until the added risk is removed or minimized.

PROJECT: JOHNSON & DIX BULK FACILITY SITE INVESTIGATION
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Fire/Explosion

Upon notification of a fire or explosion on-site, all Dufresne-Henry personnel will assemble at the decon line. The fire department shall be alerted and all Dufresne-Henry personnel moved to a safe distance from the involved area.

Personal Protective Equipment Failure

If any Dufresne-Henry site personnel experience a failure or alteration of protective equipment that effects the protection factor, that person and his/her buddy shall immediately leave the exclusion zone. Re-entry shall not be permitted until the equipment has been repaired or replaced.

Other Equipment Failure

If any other equipment on-site fails to operate properly, the Project Manager and SSO shall be notified and then determine the effect of this failure on continuing operations on-site. If the failure affects the safety of on-site Dufresne-Henry personnel or prevents the completion of the tasks, all Dufresne-Henry personnel shall leave the exclusion zone until the situation is evaluated and appropriate actions taken.

In all situations, when an on-site emergency results in evacuation of the exclusion zone, Dufresne-Henry personnel shall not re-enter until:

1. The conditions resulting in the emergency have been corrected.
2. The hazards have been reassessed.
3. The Site Safety Plan has been reviewed.
4. Dufresne-Henry personnel have been briefed on any changes in the Site Safety Plan.

PROJECT: JOHNSON & DIX BULK FACILITY SITE INVESTIGATION
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EMERGENCY INFORMATION

AMBULANCE:	Barre	Phone:	9-1-1
HOSPITAL:	Central Vermont Hospital Fisher Road Berlin, VT (see attached map)	Phone:	(802) 371 - 4100
POLICE:	Barre	Phone:	9-1-1
FIRE DEPARTMENT:	Barre	Phone:	9-1-1
POISON CENTER:		Phone:	(802) 658 - 3456
ANR INCIDENT RESPONSE:	Office Tim Cropley	Phone:	(802) 241 - 3888 (802) 241 - 3896
CORPORATE:			
	Dufresne-Henry N. Springfield, VT	Phone:	(802) 886 - 2261
	Project Manager: F. David Deane		Ext 2403
SITE REPRESENTATIVE	Neil Martin	Phone:	(802) 885 - 4547
NEAREST PHONE:	On site		
LOCATION OF ON-SITE FIRST AID KIT:	On site		
EMERGENCY VEHICLE:			

PROJECT: JOHNSON & DIX BULK FACILITY SITE INVESTIGATION
JOB NO.: 4090058

The following individuals have read this safety document and are familiar with its contents, site conditions, and on-site safety procedures (please sign below):

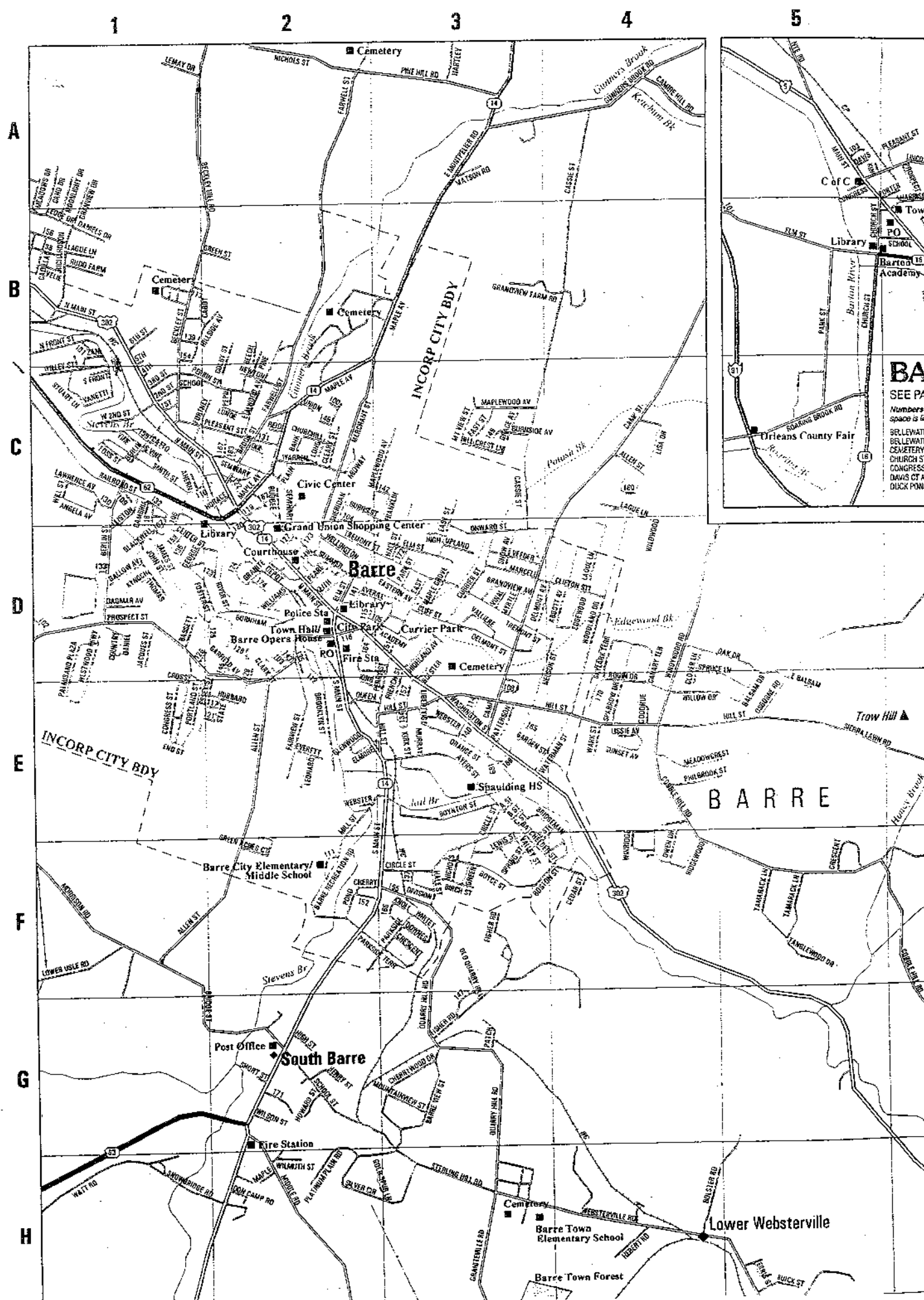
<u>Name</u>	<u>Company</u>
<u>Bruce Cox</u>	<u>Dufresne-Henry, Inc.</u>
<u>Oscar Garcia</u>	<u>Dufresne-Henry, Inc.</u>
<u>F. David Deane</u>	<u>Dufresne-Henry, Inc.</u>
<u>Myron Domingue</u>	<u>M & W Soils Engineering, Inc.</u>
<u>Michael Hitchcock</u>	<u>M & W Soils Engineering, Inc.</u>
<u>Chris Conant</u>	<u>M & W Soils Engineering, Inc.</u>
<u>William Morway</u>	<u>M & W Soils Engineering, Inc.</u>
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Copies of this SSP have been given to:

Approval Signatures:

PM _____

Div. Dir. _____



APPENDIX D

PREVIOUS WORK/INVESTIGATION DOCUMENTATION

Vermont Department of Environmental Conservation
Waste Management Division

MEMORANDUM

To: Spill File # 99-288

Thru: Marc Roy, Chief *MR*
Technical Services Section

From: Ted Unkles, Spill Team *T.U.*

Date: September 7, 1999

Subject: Trip Report, Fuel Oil Spill, Johnson & Dix facility, Barre, Vermont

On the afternoon of August 30, 1999, I visited the Johnson & Dix bulk storage facility on North Main Street in Barre. The reason for the visit was to follow up on a spill that had occurred earlier that day. According to Jim Davenport, the facility manager, at 0700 that morning a driver had offloaded approximately 8500 gallons of #2 fuel oil from a tanker truck into one of the large above-ground tanks at the facility. After disconnecting the hose, the driver failed to close one of the safety valves, and over the next hour and a half, fuel oil flowed through the vent pipe and into an overflow tank. The system was designed so that any flow from the vent pipe would go into the overflow tank, but the leak was not discovered until that 275 gallon overflow tank filled up, and approximately 60 gallons of fuel oil spilled onto the ground. Although the facility is only about 30 feet from the Stevens Branch on the Winooski River, an earthen dike on the downhill side of the bulk tanks contained the oil and stopped it from reaching the river.

Johnson & Dix apparently has an arrangement with Response Environmental, Inc. to handle spill response for the company. Because response Environmental is located in Massachusetts, they hired Environmental Products & Services out of Burlington to conduct the cleanup. EP&S reported that the cleanup was completed by approximately 1400.

I visited the facility at 1600, so I was not present during the cleanup operation conducted by Environmental Products & Services and I was therefore unable to observe the cleanup operation directly. I did, however, have the opportunity to assess the status of the bulk facility. The bulk plant appears to be built on fill material consisting primarily of granite tailings. Above the tailings is a plastic liner, presumably installed years ago to provide an impermeable layer to prevent the downward migration of any spilled petroleum products. The plastic liner now has the appearance of a well-weathered plastic tarp, with clearly visible woven plastic strands, but the material is weathered to the point that it would no longer provide even moderate prevention of downward migration. Above the plastic liner is soil, which I estimated to be about 8 inches in depth. When I arrived, I observed an area approximately six feet wide by twenty feet long, in

which all of the soil on top of the plastic had been excavated. This appeared to be the lowest spot, and was presumably the area where the spilled fuel oil had collected. According to Don Melander of EP&S, the fuel oil did not appear to have penetrated the full depth of the soil, so by removing all of the soil down to the plastic liner, they collected essentially all of the spilled fuel oil.

Overall, I found no remaining surface contamination. It appeared that EP&S had done a thorough job of removing the spilled oil and of excavating the contaminated soil. I did, however, find evidence of older contamination, and I believe this contamination warrants further investigation. There were numerous tears and other breaches in the plastic liner, and I was able to see the granite tailings very clearly. A very distinct gasoline odor appeared to be emanating from the void spaces between the first-size chunks of granite. I used a photoionization detector (Hann model 101) to screen the void spaces throughout the entire area EP&S had excavated. The PID registered consistently between 100 and 150 ppm, and had frequent peak readings in the 200 ppm range. It is important to note that this area had been open and exposed to the atmosphere for several hours prior to my arrival, so PID readings during the initial uncovering of this area probably would have been substantially higher.

I believe that the vapor readings I observed were related to an older gasoline release, not the fuel oil spill that occurred earlier in the day, because the contamination smelled distinctly of gasoline, not fuel oil. Further, EP&S personnel had indicated that the soil above the plastic liner had only been saturated with fuel oil for the first three or four inches; the bottom several inches of soil had been fairly dry. I therefore recommend an investigation to determine the degree and extent of sub-surface contamination.

Response Environmental, Inc.

October 20, 1999

VT-DEC Technical Services Section
303 South Main Street/West Office
Waterbury, VT 05671-0404

RE: VT-DEC #: WMD99-288 Spill Response Completion Report
Release Date: 8-30-99
Location: Johnson & Dix Bulk Facility
Barre, VT
30-50 Gallons Virgin #2 Fuel Oil

Gentlemen:

On August 30, 1998 at approximately 7:00 a.m., during the transfer of #2 fuel oil from a tanker-truck to a Johnson & Dix Fuel Corporation (J&D) bulk storage tank, a release of an estimated 30-50 gallons of product occurred from an air bleeder valve to an unpaved gravel area beneath the aboveground storage tanks at the bulk facility. J&D personnel immediately pumped applied absorbent material to contain and capture any free product.

The site is situated in an industrial and commercial area on North Main Street in Barre, VT. The site and surrounding area are served by municipal drinking water and sanitary sewer. The North Branch of the Winooski is located approximately 20 to 30 feet from the site. No impact to the river occurred. The site consists of bulk storage tanks, pump island, transfer area, office and storage buildings.


Response Environmental, Inc. (REI), environmental contractor for J&D's insurance carrier, was contacted at 8:35 a.m. by J&D personnel and subsequently dispatched a response crew to respond to the site, inspect the release, report observations to REI and to undertake appropriate clean-up actions. J & D contacted the local Fire Department directly at 8:45 a.m.. REI contacted the VT-DEC at 9:00 a.m. on behalf J&D. The VT-DEC took verbal notification of the release.

Upon inspection of the AST area, it was noted that the release had impacted an approximate 20' x 6' area of gravel and soil beneath a horizontal bulk storage tank. The bulk storage tank area is bordered on three sides by four-foot high earthen berms. A pool of #2 fuel oil was pumped into a drum by response personnel. Approximately 20 gallons of #2 fuel oil was recovered in this process. The ground beneath the AST consisted of silty sand from approximately ground surface to 3 inches below ground surface (bgs). A liner of polyethylene existed below the silty sand in the vicinity of the AST. Below the liner, 6 inches of gravel is in place followed by large granite boulders. The top 3-4 inches of soil was saturated with #2 fuel oil in the affected area; however, the soil in direct contact with the liner was found to be unaffected.

Approximately 1.25 cubic yards of impacted material was excavated from above the liner. The excavated material and absorbent material, initially applied by J&D personnel, was placed within four 17H DOT drums. These drums along with the drum of liquid pumped from the area was removed from the site under manifest for proper disposal. The impacted area was to be covered with new polyethylene sheeting upon completion of actions and regraded by J&D personnel. At this time all actions relative to this release have been completed and no further actions are planned.

If you have any questions please contact me at (508) 795-0110.

Sincerely,


Glenn S. Goral, LSP

Cc: Mr. Neil Martin
Johnson & Dix Fuel Corporation
240 Mechanic Street
Lebanon, NH 03766

Mr. Rick Butera Claim # 702-500398
Great American Insurance Companies
P.O. Box 60743
Longmeadow, MA 01116

REI Project File

APPENDIX E

BORING LOGS AND DAILY REPORT

BORING LOCATION MW-1		INCLINATION V		BEARING		DATE START/FINISH JANUARY 5, 2000 / JANUARY 5, 2000	
CASING ID		CORE SIZE		TOTAL DEPTH 16.0 FT		DRILLED BY: M & W SOILS ENGINEERING, INC. (M.H.)	
GROUND EL (AD) 999.34		DEPTH TO WATER/DATE 10± FT/ IMMED.		LOGGED BY: B. COX			

ELEV	SAMPLE			SAMP OD (IN)	LENGTH		REMARKS ON ADVANCE OF BORING	SIZE/TYPE BIT USED TO ADVANCE BORING	SOIL AND ROCK DESCRIPTION	
	AD (FT)	DEPTH (FT)	TYPE AND NO.		B	REC (IN)				PENE-TRATION (IN)
996.34	3.0						4"/SSA	4 1/2" FB	0" - 3.5" BITUMINOUS CONCRETE PAVEMENT. 3.5" - 3' Medium brown, sandy GRAVEL FILL with probable granite blocks and chips.	
996.01	3.33		SS-1	60*	2	3	4	* 60/4"	Dark brown, silty, gravelly, SAND. Predominately very fine - medium grained, moderately well sorted sand. 20%± non plastic fines. 30%+ fine rounded gravel 1/4" - probable cobble or boulder size granite rubble. Dry. No odor or staining. 8.8 ppm.	
995.34	4.0							4"/SSA	4 1/2" FB	Probable gravelly SAND with granite rubble as above.
993.34	6.0			4 3 3 3	2	0	24			Probable loose, silty SAND.
991.34	8.0		SS-2	4 3 5 4	2	18	24			Medium - dark brown, loose, silty SAND and sandy SILT. Very fine grained, well sorted sand. 50%± non plastic, inorganic fines. Slightly moist. No odor or staining. 0.8 ppm.
989.34	10.0							4"/SSA	4 1/2" FB	Probable silty SAND similar to above, becoming slightly gravelly.
987.34	12.0		SS-3	3 6 18 20	2	24	24			Medium - dark gray and brown, medium dense - dense, gravelly, silty SAND. Very fine - occasionally coarse grained (predominately very fine - medium grained), moderately poorly sorted sand. 20%± non plastic fines. 10%+ fine gravel to 3/8". Abundant mica. Saturated. No odor or staining. 0.5 ppm.
985.34	14.0		SS-4	18 18 29 16	2	19	24			Medium - dark gray brown, dense, silty, gravelly SAND similar to above, but with more gravel, particularly in the bottom foot. Very dense, silty till bottom 1" - 2". Saturated, except for till which is relatively dry. No odor or staining. 0.3 ppm
983.34	16.0							4"/SSA	4 1/2" FB	Probable dense TILL similar to above.
										No refusal to depth. Installed 10' of 2" dia, 0.010" slot, threaded, flush joint, SCHD 40 PVC at 15'6". Sand backfill to 3'6". Bentonite seal 3' - 3'6". Grouted in flush, watertight, cast Iron monitoring well box.

<p>B - Penetration resistance, Blows/6" of a 140 lb hammer falling 30 in to drive a split spoon sampler.</p> <p>REC - Length of sample recovered.</p> <p>SS - Split spoon sample.</p> <p>U - Undisturbed samples</p> <p style="margin-left: 20px;">S - Shelby tube D - Denison</p> <p style="margin-left: 20px;">F - Fixed piston P - Pitcher</p> <p style="margin-left: 20px;">O - Osterberg</p> <p>SAMP OD - Outside diameter of sampling spoon</p>	<p>NOTES</p> <p>SSA = Solid Stem Auger</p> <p>FB = Finger Bit</p> <p>ppm Refers to PID reading (10.6 eV lamp)</p> <p>Top of PVC = 998.92</p>	<p style="text-align: center;">JOHNSON & DIX FUEL CORPORATION BULK STORAGE FACILITY INITIAL SITE INVESTIGATION</p> <p style="text-align: right;">VERMONT</p> <p>BARRE,</p> <p>DATE: JANUARY 5, 2000 PROJECT: 4090058</p>
		<p>PAGE 1 OF 1 LOG OF BORING: MW-1</p>

DH DUFRESNE-HENRY, INC.



BORING LOCATION MW-2		INCLINATION V		BEARING		DATE START/FINISH JANUARY 5, 2000 / JANUARY 5, 2000	
CASING ID		CORE SIZE		TOTAL DEPTH 16.0 FT		DRILLED BY: M & W SOILS ENGINEERING, INC. (M.H.)	
GROUND EL (AD) 999.46		DEPTH TO WATER/DATE 11±		FT/ IMMED.		LOGGED BY: B. COX	

ELEV	SAMPLE			SAMP OD (IN)	LENGTH		REMARKS ON ADVANCE OF BORING	SIZE/TYPE BIT USED TO ADVANCE BORING	SOIL AND ROCK DESCRIPTION	
	AD (FT)	DEPTH (FT)	TYPE AND NO.		B	REC (IN)				PENE-TRATION (IN)
994.46	5.0						4"/SSA	4 1/2" FB	Medium brown, gravelly SAND FILL.	
992.46	7.0		SS-1	6 2 4 2	2	8	24		Light - medium brown, loose, gravelly SAND FILL. Very fine - occasionally medium grained, moderately well sorted sand. 10% - 20% non plastic fines. 30%± gravel 1/8" - cobbles and boulders. Dry - slightly moist. No odor or staining. 0.0 ppm.	
990.46	9.0		SS-2	4 4 3 3	2	16	24		Medium gray brown, loose, silty SAND and sandy SILT. Very fine grained, well sorted sand. 50%± non plastic, generally inorganic fines. Trace of mica. Trace of wood at 8' (apparent old ground). Moist. No odor or staining. 0.0 ppm.	
988.46	11.0		SS-3	3 3 3 3	2	14	24		Medium and dark brown - gray at bottom, loose, silty SAND similar to above, but slightly coarser grained overall. Very fine - fine grained, well sorted sand. 30%+ non plastic fines. Trace of mica. Moist - wet at bottom. No odor or staining. 0.0 ppm.	
986.46	13.0		SS-4	3 4 7 8	2	16	24		Medium brown, loose - medium dense, silty SAND. Very fine - fine grained, well sorted sand. 20% - 30%+ non plastic fines. Occasional 1" - 2" layers of medium gray siltier sand. A few light - medium orange mottles in the upper foot. Saturated. No odor or staining. 0.0 ppm.	
984.46	15.0		SS-5	5 6 9 17	2	12	24		13' - 14'6"± Medium brown and gray, medium dense, silty SAND similar to above. Saturated. No odor or staining. 0.0 ppm. 14'6" - 15' Dark gray, dense TILL. Very silty. Some fine gravel, mostly upper in 3"±. Much dryer than above.	
983.46	16.0							4"/SSA	4 1/2" FB	Probable dense TILL similar to above.
										<p>No refusal to depth.</p> <p>Installed 10' of 2" dia, 0.010" slot, threaded, flush joint, SCHD 40 PVC at 15'4". Sand backfill to 3'6". Bentonite seal 2'6" - 3'6". Grouted in flush, watertight, cast iron monitoring well box.</p>

<p>B - Penetration resistance, Blows/6" of a 140 lb hammer falling 30" in to drive a split spoon sampler.</p> <p>REC - Length of sample recovered.</p> <p>SS - Split spoon sample.</p> <p>U - Undisturbed samples</p> <p style="margin-left: 20px;">S - Shelby tube D - Denison</p> <p style="margin-left: 20px;">F - Fixed piston P - Pitcher</p> <p style="margin-left: 20px;">O - Osterberg</p> <p>SAMP OD - Outside diameter of sampling spoon</p>	<p>NOTES</p> <p>SSA = Solid Stem Auger</p> <p>FB = Finger Bit</p> <p>ppm Refers to PID reading (10.6 eV lamp)</p> <p>Top of PVC = 999.05</p>	<p>JOHNSON & DIX FUEL CORPORATION</p> <p>BULK STORAGE FACILITY</p> <p>INITIAL SITE INVESTIGATION</p> <p>BARRE, VERMONT</p> <p>DATE: JANUARY 5, 2000 PROJECT: 4090058</p>
<p>PAGE 1 OF 1</p>		<p>LOG OF BORING: MW-2</p>



BORING LOCATION MW-3		INCLINATION V		BEARING		DATE START/FINISH JANUARY 5, 2000 / JANUARY 5, 2000	
CASING ID		CORE SIZE		TOTAL DEPTH 14.0 FT		DRILLED BY: M & W SOILS ENGINEERING, INC. (M.D.)	
GROUND EL (AD) 997.66		DEPTH TO WATER/DATE 5±		FT/ IMMED.		LOGGED BY: B. COX	

ELEV	SAMPLE			SAMP OD (IN)	LENGTH		REMARKS ON ADVANCE OF BORING	SIZE/TYPE BIT USED TO ADVANCE BORING	SOIL AND ROCK DESCRIPTION
	DEPTH (FT)	TYPE AND NO.	B		REC (IN)	PENE-TRATION (IN)			
996.16	1.5						Impact Drill		Probable silty, sandy, GRAVEL FILL.
993.16	3.0	SS-1	24 11 14	2	14	18			Medium - dark gray brown, silty, sandy, GRAVEL FILL. Very fine - medium grained sand. 20%+ non plastic fines. 50%+ gravel 1/8" - 1"+. Trace of cinders. Wet. Faint oily odor (much of sample frozen). 7.2 ppm.
992.66	5.0	SS-2	26 6 3 2	2	12	24			3' - 3'6" Medium - dark gray brown, silty, sandy, GRAVEL FILL as above. 3'6" - 5' Dark brown gray, loose, silty, gravelly, SAND (with granite rubble). Very fine - fine grained, well sorted sand. 30%+ non plastic fines. Moist - wet. Moderate - strong oily odor. 238 ppm peak, 100+ ppm sustained.
990.66	7.0	SS-3	3 3 4 4	2	1	24			Probable loose, silty, gravelly SAND similar to above. Saturated. Oily odor. 92 ppm.
988.66	9.0	SS-4	3 4 4 4	2	13	24			Medium - dark gray, loose, silty SAND. Very fine grained, well sorted sand. 40%+ non plastic fines. Trace of mica. Saturated. Moderate - strong oily gasoline odor. 580 ppm peak, 300+ ppm sustained.
986.66	11.0	SS-5	4 3 3 8	2	8	24			Medium - dark brown, loose - medium dense, silty SAND similar to above. Traces of topsoil and grass (apparent old ground). Saturated. Moderate - strong oily odor (with a sheeny appearance to the soil). 1,540 ppm peak, 60+ ppm sustained.
984.66	13.0	SS-4	10 12 12 13	2	13	24			Medium - dark gray, medium dense, silty SAND similar to above. 10%+ fine gravel. Traces of wood. Saturated. Moderate oily gasoline odor. 167 ppm peak, 100+ ppm sustained.
983.66	14.0	SS-5	6 3	2		12			Probable loose, silty SAND similar to above.
									No refusal to depth. Installed 10' of 1" dia, galvanized steel pipe at 14'. Sand backfill to 2'6". Bentonite seal 0' - 2'6". Threaded cap installed on top of pipe.

<p>B - Penetration resistance, Blows/6" of a 140 lb hammer falling 30 in to drive a split spoon sampler.</p> <p>REC - Length of sample recovered.</p> <p>SS - Split spoon sample.</p> <p>U - Undisturbed samples</p> <p style="margin-left: 20px;">S - Shelby tube D - Denison</p> <p style="margin-left: 20px;">F - Fixed piston P - Pitcher</p> <p style="margin-left: 20px;">O - Osterberg</p> <p>SAMP OD - Outside diameter of sampling spoon</p>	<p>NOTES</p> <p>Boring done with portable tripod.</p> <p>ppm Refers to PID reading (10.6 eV lamp)</p> <p>Top of galv. steel pipe = 999.21</p>	<p>JOHNSON & DIX FUEL CORPORATION BULK STORAGE FACILITY INITIAL SITE INVESTIGATION</p> <p style="text-align: right;">VERMONT</p> <p>BARRE,</p> <p>DATE: JANUARY 5, 2000 PROJECT: 4090058</p>
		<p>PAGE 1 OF 1 LOG OF BORING: MW-3</p>

BORING LOCATION MW-4		INCLINATION V		BEARING		DATE START/FINISH JANUARY 5, 2000 / JANUARY 5, 2000	
CASING ID		CORE SIZE		TOTAL DEPTH 16.5 FT		DRILLED BY: M & W SOILS ENGINEERING, INC. (M.D.)	
GROUND EL (AD) 998.02		DEPTH TO WATER/DATE 9±		FT/ IMMED.		LOGGED BY: B. COX	

ELEV	SAMPLE			SAMP OD (IN)	LENGTH		REMARKS ON ADVANCE OF BORING	SIZE/TYPE BIT USED TO ADVANCE BORING	SOIL AND ROCK DESCRIPTION
	DEPTH (FT)	TYPE AND NO.	B		REC (IN)	PENE-TRATION (IN)			
997.02	1.0						Impact Drill		Probable silty, sandy, GRAVEL FILL.
995.02	3.0	SS-1	3 5 7 5	2	16	24			Dark brown and gray, silty, gravelly, SAND FILL. Very fine - coarse grained, poorly sorted sand. 10%± non plastic fines. 20% - 30% gravel 1/8" - probable cobbles. Dry (frozen). No odor or staining. 3.2 ppm.
993.02	5.0	SS-2	15 7 3 2	2	10	24			Medium gray, loose, silty, gravelly, SAND FILL similar to above, but grayer. Dry. Faint oily odor. 242 ppm peak, 100+ ppm sustained.
991.02	7.0	SS-3	2 2 3 3	2	13	24			Medium gray, loose, silty SAND. Very fine - fine grained, well sorted sand. 30%± non plastic fines. Dry. Moderate - strong oily gasoline odor. 464 ppm peak, 200+ ppm sustained.
989.02	9.0	SS-4	3 3 3 3	2	20	24			Medium - dark gray, loose, silty SAND similar to above, but grayer. Dry - slightly moist. Strong oily gasoline odor. 1,220 ppm peak, 800+ ppm sustained.
987.02	11.0	SS-5	3 2 2 1	2	20	24			Medium - dark gray, very loose - loose, silty SAND as above. Saturated. Faint - moderate oily odor. 609 ppm peak, 100+ ppm sustained.
985.02	13.0	SS-6	2 3 4 4	2	18	24			Dark gray, loose, silty, gravelly, SAND. Very fine - very coarse grained, poorly sorted sand. 10%± non plastic fines. 20%+ fine rounded gravel 1/8" - 3/8". Faint odor above 12±, no odor below 12'. 65 ppm peak, 30+ ppm sustained.
983.02	15.0	SS-7	4 5 8 8	2	24	24			Dark gray, loose - medium dense, silty, gravelly SAND similar to above. Saturated. Very faint - no odor. 46 ppm peak, 20+ ppm sustained.
981.60	16.42	SS-8	35 31 60*	2	17	17	* 60/5"		Dark gray, very dense, silty TILL. 9.4 ppm
									<p>No refusal to depth.</p> <p>Installed 10' of 1" dia, galvanized steel pipe at 16'. Sand backfill to 4'. Bentonite seal 0' - 4'. Threaded cap installed on top of pipe.</p>

<p>B - Penetration resistance, Blows/6" of a 140 lb hammer falling 30" in to drive a split spoon sampler.</p> <p>REC - Length of sample recovered.</p> <p>SS - Split spoon sample.</p> <p>U - Undisturbed samples</p> <p>S - Shelby tube D - Denison</p> <p>F - Fixed piston P - Pitcher</p> <p>O - Osterberg</p> <p>SAMP OD - Outside diameter of sampling spoon</p>	<p>NOTES</p> <p>Boring done with portable tripod.</p> <p>ppm Refers to PID reading (10.6 eV lamp)</p> <p>Top of galv. steel pipe = 999.47</p>	<p>JOHNSON & DIX FUEL CORPORATION BULK STORAGE FACILITY INITIAL SITE INVESTIGATION</p> <p>BARRE, VERMONT</p> <p>DATE: JANUARY 5, 2000 PROJECT: 4090058</p>
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M & W Soils Engineering Inc.
Main St. Charlestown, NH 03603

TO DUFRESNE-HENRY, INC. ADDRESS NORTH SPRINGFIELD, VT
PROJECT NAME JOHNSON & DIX LOCATION BARRE, VT
REPORT SENT TO BRUCE COX PROJ. NO. _____
SAMPLES RETAINED BY DUFRESNE-HENRY, INC. OUR JOB NO. 8005-00

SHEET 1 OF 1
DATE 1/5/00
HOLE NO. MW-1
LINE & STA. _____
OFFSET _____

GROUND WATER OBSERVATIONS		Type Size I. D. Hammer Wt. Hammer Fall	CASING HSA 4 1/4" 140# 30"	SAMPLER SS 1 1/2" BIT	CORE BAR	SURFACE ELEV. _____
AT <u>11:4</u>	AT <u>1/2</u> HOURS					DATE STARTED <u>1/5/00</u>
AT _____	AT _____ HOURS					DATE COMPL. <u>1/5/00</u>
						BORING FORMAN <u>M.H. & W.M.</u>
						INSPECTOR <u>B. COX</u>
						SOILS ENGR. _____

LOCATION OF BORING 15' EAST OF PUMPS, IN DRIVE, AS MARKED

Depth	SAMPLE DEPTHS FROM-TO	TYPE OF SAMPLE	Blows per 6" on sampler	MOISTURE DENSITY OR CONSIST.	STRATA CHANGE ELEV.	FIELD SOIL IDENTIFICATION Remarks include color, gradation, Type of soil etc. Rock-color, type, cond., hardness, Drilling time, seams and ect	SAMPLE		
							NO.	PEN	REC
					3 1/2"	ASPHALT			
	3' - 3'4"	SS	60/4"	MED. DENSE		BROWN GRAVELLY FILL WITH COBBLES AND BOULDERS	1	4"	2"
	4' - 6'	SS	4 3		4' +/-		2	24"	0"
5'	6' - 8'	SS	4 3				3	24"	21"
			5 4	LOOSE		BROWN SILTY FINE SAND			
					9'				
10'	10' - 12'	SS	3 6				4	24"	20"
			18 20						
	12' - 14'	SS	18 18	MED. DENSE		BROWN FINE TO MEDIUM SAND - TRACE OF FINE GRAVEL	5	24"	21"
			29 16	WET					
					13'6"				
15'				DENSE		GRAVELLY SILTS AND SANDS			
					16'				
20'						NO BEDROCK TO DEPTH			
						SET 2" WELL AT 15'6"			
						TOP OF WELL AT 5'6"			
						SAND TO 3'6"			
						BENTONITE TO 2'6"			
						MATERIALS USED:			
						10' OF 2" PVC 0.010" SLOT SCREEN			
						5' OF 2" PVC SOLID			
						10# OF BENTONITE CHIPS			
						100# OF SAND			
						40# OF CEMENT MIX			
						1 2" GRIPPER			
						1 2" PVC CAP			
						1 8" CAST IRON MANHOLE			

GROUND SURFACE TO 16'

USED 16' CASING THEN _____

Sample Type
D-Dry C-Cored W-Washed
UP-Unfinished Piston
TP-Test Pit A-Auger V-Vane Test
UT-Undisturbed Thinwall

Proportions Used
trace 0 to 10%
little 10 to 20%
some 20 to 35%
and 35 to 50%

140 lb. wt. x 30"-fall an 2" O.D. Sampler
Cohesionless Density
0-10 Loose
10-30 Med. Dense
30-50 Dense
50+ Very Dense
Cohesive Consistency
0-4 Soft 30 + Hard
4-8 M/Stiff
8-15 Stiff
15-30 V-Stiff

summary

EARTH BORING 16'
ROCK CORING _____
SAMPLES 5
HOLE NO. MW-1

M & W Soils Engineering Inc.
Main St. Charlestown, NH 03603

TO DUFFESNE-HENRY, INC. ADDRESS NORTH SPRINGFIELD, VT
PROJECT NAME JOHNSON & DIX LOCATION BARRE, VT
REPORT SENT TO BRUCE COX PROJ. NO. _____
SAMPLES RETAINED BY DUFFESNE-HENRY, INC. OUR JOB NO. 8005-00

SHEET 1 OF 1
DATE 1/5/00
HOLE NO. MW-2
LINE & STA. _____
OFFSET _____

GROUND WATER OBSERVATIONS		Type Size I. D. Hammer Wt. Hammer Fall	CASING HSA 4 1/4"	SAMPLER SS 1 1/2"	CORE BAR BIT 30"	SURFACE ELEV. _____
AT <u>10:00</u> AT <u>1</u> HOURS	DATE STARTED <u>1/5/00</u>					
AT _____ AT _____ HOURS	DATE COMPL. <u>1/5/00</u>	BORING FORMAN <u>M.H. & W.M.</u>				
				INSPECTOR <u>B. COX</u>		
				SOILS ENGR. _____		

LOCATION OF BORING 15' WEST OF STORAGE TANK #3

Depth	SAMPLE DEPTHS FROM-TO	TYPE OF SAMPLE	Blows per 6" on sampler	MOISTURE DENSITY OR CONSIST.	STRATA CHANGE ELEV.	FIELD SOIL IDENTIFICATION Remarks include color, gradation, Type of soil etc. Rock-color, type, cond., hardness, Drilling time, seams and ect	SAMPLE		
							NO.	PEN	REC
5'				FROZEN	2'	SANDY FILL			
	5' - 7'	SS	6 2				1	24"	14"
			4 2	LOOSE		SANDY FILL WITH COBBLES AND BOULDERS			
	7' - 9'	SS	4 4				2	24"	16"
10'			4 3			(TRACE OF WOOD AT 8')			
	9' - 11'	SS	3 3		8'6" +/-	OLD GROUND	3	24"	14"
			3 3						
	11' - 13'	SS	3 4	LOOSE		BROWN FINE TO MEDIUM SAND	4	24"	16"
			7 8						
15'	13' - 15'	SS	5 6				5	24"	18"
			9 17						
				VERY DENSE	14'6"				
					16'	GREY GRAVELLY SILTS AND SANDS			
						NO BEDROCK TO DEPTH			
20'						SET 2" WELL AT 15'			
						TOP OF WELL AT 5'6"			
						SAND TO 3'6"			
						BENTONITE TO 2'6"			
						MATERIALS USED:			
						10' OF 2" PVC 0.010" SLOT SCREEN			
						5' OF 2" PVC SOLID			
						15# OF BENTONITE CHIPS			
						150# OF SAND			
						40# OF CEMENT MIX			
						1 2" GRIPPER			
						1 2" PVC CAP			
						1 6" CAST IRON MANHOLE			

GROUND SURFACE TO 16'

USED 16' CASING THEN

Sample Type	Proportions Used	140 lb. wt. x 30"-fall an 2" O.D. Sampler	summary
D-Dry C-Cored W-Washed	trace 0 to 10%	Cohesionless Density	EARTH BORING <u>16'</u>
UP-Unfinished Piston	little 10 to 20%	0-10 Loose	ROCK CORING _____
TP-Test Pit A-Auger V-Vane Test	some 20 to 35%	10-30 Med. Dense	SAMPLES <u>5</u>
UT-Un disturbed Thinwall	and 35 to 50%	30-50 Dense	HOLE NO. <u>MW-2</u>
		50+ Very Dense	
		Cohesive Consistency	
		0-4 Soft 30 + Hard	
		4-8 M/Stiff	
		8-15 Stiff	
		15-30 V-Stiff	

M & W Soils Engineering Inc.

Main St.

Charlestown, NH 03603

SHEET 1 OF 1

DATE 1/5/00

HOLE NO. MW-3

LINE & STA.

OFFSET

TO DUFRESNE-HENRY, INC.

ADDRESS NORTH SPRINGFIELD, VT

PROJECT NAME JOHNSON & DIX

LOCATION BARRE, VT

REPORT SENT TO BRUCE COX

PROJ. NO.

SAMPLES RETAINED BY DUFRESNE-HENRY, INC.

OUR JOB NO. 8005-00

GROUND WATER OBSERVATIONS		Type	CASING	SAMPLER	CORE BAR	SURFACE ELEV.
AT 5'	AT IMMEDIATELY	Size I. D.	TRIPOD	SS		DATE STARTED 1/5/00
	HOURS	Hammer Wt.		1 1/2"		DATE COMPL. 1/5/00
		Hammer Fall		140#	BIT	BORING FORMAN M.D. & C.C.
				30"		INSPECTOR
						SOILS ENGR.

LOCATION OF BORING BETWEEN PUMP STATION AND TANKS

Depth	SAMPLE DEPTHS FROM-TO	TYPE OF SAMPLE	Blows per 6" on sampler	MOISTURE DENSITY OR CONSIST.	STRATA CHANGE ELEV.	FIELD SOIL IDENTIFICATION Remarks include color, gradation, Type of soil etc. Rock-color, type, cond., hardness, Drilling time, seams and ect.	SAMPLE		
							NO.	PEN.	REC.
5'	1'6" - 3'	SS	24	11		FROST	1	18"	14"
			14		DENSE - WET	BROWN CINDERS AND SILTY SANDY GRAVELS	2	24"	12"
	3' - 5'	SS	25	6					
			3	2	LOOSE - MOIST	BLACK FINE SANDS AND SILT WITH TRACE OF GRAVELS (OILY ODOR)	3	24"	1"
	5' - 7'	SS	3	3			4	24"	13"
10'			4	4					
	7' - 9'	SS	3	4			5	24"	8"
			4	4	LOOSE - MOIST	(BROWN PIECES OF TOPSOIL, GRASS IN SAMPLE #5) GREYISH FINE SANDS WITH LITTLE SILTS - TRACE OF WOOD (OILY ODOR) (WOOD IN SAMPLE #6)	6	24"	13"
	9' - 11'	SS	4	3					
			3	8					
15'	11' - 13'	SS	10	12					
			12	13					
	13' - 14'	SS	5	3		(TILL) OLD GROUND			
						SET 1" GALVANIZED STEEL PIPE TO 14'			
						TOP OF WELL AT 4'			
						BOTTOM OF WELL AT 14'			
						SILICA SANDS FROM 2'6" TO 14'			
						BENTONITE SEAL FROM 0' TO 2'6"			
						MATERIALS USED:			
						15' OF 1" GALVANIZED PIPE			
						1 1" GALVANIZED CAP			
						2 1" GALVANIZED COUPLINGS			

GROUND SURFACE TO 14'

USED 14'

CASING THEN DROVE SS 12" TO 14'

Sample Type

D-Dry C-Cored W-Washed

UP-Unfinished Piston

TP-Test Pit A-Auger V-Vane

UT-Undisturbed Thinwall

Proportions Used

trace 0 to 10%
little 10 to 20%
some 20 to 35%
and 35 to 50%

140 lb. wt. x 30"-fall an 2" O.D. Sampler
Cohesionless Density
0-10 Loose
10-30 Med. Dense
30-50 Dense
50+ Very Dense
Cohesive Consistency
0-4 Soft 30 + Hard
4-8 M/Stiff
8-15 Stiff
15-30 V-Stiff

summary

EARTH BORING 14'

ROCK CORING

SAMPLES 6

HOLE NO. MW-3

M & W Soils Engineering Inc.
Main St. Charlestown, NH 03603

TO DUFFRESNE-HENRY, INC. ADDRESS NORTH SPRINGFIELD, VT
PROJECT NAME JOHNSON & DIX LOCATION BARRE, VT
REPORT SENT TO BRUCE COX PROJ. NO. _____
SAMPLES RETAINED BY DUFFRESNE-HENRY, INC. OUR JOB NO. 8005-00

SHEET 1 OF 1
DATE 1/5/00
HOLE NO. MW-4
LINE & STA. _____
OFFSET _____

GROUND WATER OBSERVATIONS		Type Size I. D. Hammer Wt. Hammer Fall	CASING TRIPOD	SAMPLER SS	CORE BAR 1 1/2" 140# 30"	BIT	SURFACE ELEV. _____
AT <u>9:45</u> AT <u>IMMEDIATELY</u> HOURS	DATE STARTED <u>1/5/00</u>						
AT _____ AT _____ HOURS	DATE COMPL. <u>1/5/00</u>	BORING FORMAN <u>M.D. & C.C.</u>					
							INSPECTOR _____
							SOILS ENGR. _____

LOCATION OF BORING BEHIND TANKS, EAST OF SPILL

Depth	SAMPLE DEPTHS FROM-TO	TYPE OF SAMPLE	Blows per 6" on sampler		MOISTURE DENSITY OR CONSIST.	STRATA CHANGE ELEV.	FIELD SOIL IDENTIFICATION Remarks include color, gradation, Type of soil etc. Rock-color, type, cond., hardness. Drilling time, seams and ect.	SAMPLE		
								NO.	PEN	REC
5'	3' - 5'	SS	3	5	FROZEN	5'	BROWN SANDY FILL WITH COBBLES (OIL ODOR)	1	24"	16"
			7	5				2	24"	10"
	5' - 7'	SS	2	2				3	24"	18"
	7' - 9'	SS	3	3				4	24"	20"
	9' - 11'	SS	3	2				5	24"	20"
10'	11' - 13'	SS	2	3	WET	11'	BROWN FINE SANDS - TRACE OF SILT (OILY ODOR)	6	24"	18"
	13' - 15'	SS	4	4				7	24"	24"
	15' - 16'5"	SS	35	31				8	18"	18"
20'			60		LOOSE TO DENSE	16'5"	(OIL ODOR STOPPED AT 12' DEPTH) SAME MATERIAL AS ABOVE WITH COARSE SAND LAYERS			
							NO BEDROCK TO DEPTH			
							SET 1" GALVANIZED STEEL PIPE TO 16'			
							TOP OF WELL AT 6'			
							BOTTOM OF WELL AT 16'			
							SAND TO 4'			
							BENTONITE TO SURFACE			
							MATERIALS USED:			
							17' OF 1" GALVANIZED PIPE			
							1 1" GALVANIZED CAP			
							3 1" GALVANIZED COUPLINGS			

GROUND SURFACE TO 16'5"

USED 16'5"

CASING THEN DROVE SS 18" TO 16'5"

Sample Type

D-Dry C-Cored W-Washed
UP-Unfinished Piston
TP-Test Pit A-Auger V-Vane Test
UT-Undisturbed Thinwall

Proportions Used
trace 0 to 10%
little 10 to 20%
some 20 to 35%
and 35 to 50%

140 lb. wt. x 30"-fall an 2" O.D. Sampler
Cohesionless Density
0-10 Loose
10-30 Med. Dense
30-50 Dense
50+ Very Dense
Cohensive Consistency
0-4 Soft 30 + Hard
4-8 M/Stiff
8-15 Stiff
15-30 V-Stiff

summary

EARTH BORING 16'5"
ROCK CORING _____
SAMPLES 8

HOLE NO. MW-4

JOHNSON & DIX FUEL CORPORATION - BULK STORAGE FACILITY
SITE INVESTIGATION
BARRE, VERMONT

January 5, 2000

Dufresne-Henry, Inc. - Bruce Cox on site at 8:20 am.

M & W Soils Engineering, Inc. - Michael Hitchcock, Christopher Conant, and William Morway on site at 8:30 am. Myron Domingue at 10:00am±.

I went to the City Engineers office at 8:05 am to check on the location of water and sewer lines. There is a 6" water main that crosses the site. A Water Department representative was on site at 8:45 am to locate that line.

I spoke with Jim Davenport, the J & D facility manager, and outlined the general scope of work and location of the borings.

MW-1

MW-1 is located at the south end of the public use fuel pump island. The boring was started at 8:40 am. The rig and other equipment had been steam cleaned prior to arrival on site. All water used for cleaning split spoons and other tools was obtained at the site. Drilled with 4" solid stem augers attempting to take continuous split spoon samples starting at 3 feet. All samples were screened for VOC's with a Photovac HL-2000 (10.6 eV lamp, calibrated with 101 ppm Isobutylene). The screening was done in the headspace of the unwarmed sample jars in a warm vehicle. Representative soil samples from each split spoon were stored in clear glass jars and retained by Dufresne-Henry. No analytical soil samples were collected. Total depth of the boring was 16' with no refusal. The general geologic column is bituminous concrete pavement to 3.5", sands gravel fill (with granite chips and blocks) to approximately 4', silty sand and sandy silt to approximately 10', gravelly sand to approximately 14', and till to the limit of the boring. No evidence of contamination was observed by visual or olfactory senses in the samples or on the tools. Peak PID readings ranged from 0.3 ppm to 8.8 ppm. The water table was encountered at approximately 10'. Installed a 10' long, 2" diameter, 0.010" machine slotted, threaded, flush joint, Schedule 40 PVC well at 15.5'. All pipe came from factory sealed plastic bags. The annular space was backfilled with clean silica sand to 3'6". A bentonite seal was installed from 3' - 3'6". An 8" diameter cast iron, watertight, monitoring well box was grouted in at the surface.

Materials: 10' of 2", .010" slot, threaded, flush joint, Schd 40 PVC.
5' of 2", solid wall, threaded, flush joint, Schd 40 PVC.
100 lb of silica sand.
10 lb± of bentonite chips.
40 lb of concrete mix.
1 2" push-on PVC cap.
1 2" expanding gasket cap.
1 8" monitoring well box.

MW-2

MW-2 is located at the north end of the AST's. The boring was started at 10:55 am. All water used for cleaning split spoons and other tools was obtained at the site. Drilled with 4" solid stem augers taking continuous split spoon samples starting at 5 feet. All samples were screened for VOC's with a Photovac HL-2000 (10.6 eV lamp, calibrated with 101 ppm Isobutylene). The screening was done in the headspace of the unwarmed sample jars in a warm vehicle. Representative soil samples from each split spoon were stored in clear glass jars and retained by Dufresne-Henry. No analytical soil samples were collected. Total depth of the boring was 16' with no refusal. The general geologic column is gravelly sand fill to approximately 7', silty sand and sandy silt to approximately 15', and till to the limit of the boring. No evidence of contamination was observed by visual or olfactory senses in the samples or on the tools. Peak PID readings were 0.0 ppm. The water table was encountered at approximately 11'. Installed a 10' long, 2" diameter, 0.010" machine slotted, threaded, flush joint, Schedule 40 PVC well at 15'4". All pipe came from factory sealed plastic bags. The annular space was backfilled with clean silica sand to 3'6". A bentonite seal was installed from 2'6" - 3'6". A 6" diameter cast iron, watertight, monitoring well box was grouted in at the surface.

Materials: 10' of 2", .010" slot, threaded, flush joint, Schd 40 PVC.
5' of 2", solid wall, threaded, flush joint, Schd 40 PVC.
100 lb of silica sand.
15 lb± of bentonite chips.
40 lb of concrete mix.
1 2" push-on PVC cap.
1 2" expanding gasket cap.
1 6" monitoring well box.

MW-3

MW-3 is located in the area of the spill between the vertical and horizontal AST's. The boring was started at 10:45 am±. All water used for cleaning split spoons and other tools was obtained at the site. A portable tripod rig was used to drive continuous split spoons starting at 1.5 feet. The first 1.5 feet were advanced through the frost using an impact drill. All samples were screened for VOC's with a Photovac HL-2000 (10.6 eV lamp, calibrated with 101 ppm Isobutylene). The screening was done in the headspace of the unwarmed sample jars in a warm vehicle. Representative soil samples from each split spoon were stored in clear glass jars and retained by Dufresne-Henry. No analytical soil samples were collected. Total depth of the boring was 14' with no refusal. The general geologic column is sandy gravel fill to approximately 3'6", and silty sand to the limit of the boring. Evidence of petroleum contamination was observed between 1.5' and 13'±. Odors are noted as oily or oily gasoline. Peak PID readings ranged from 7.4 ppm to 1,540 ppm. The water table was encountered at approximately 5'. Installed a 10' long, 1" diameter, hand slotted galvanized steel pipe at 14'. The annular space was backfilled with clean silica sand to 2'6". A bentonite seal was installed from 0' - 2'6". The top of the pipe is 1.55' above the ground surface and has a threaded cap.

Materials: 10' of 1", hand slotted galvanized steel pipe.

5.5' of 1", solid wall, galvanized steel pipe.
<50 lb of silica sand.
15 lb± of bentonite chips.
2 1" galvanized couplings.
1 1" threaded galvanized cap.

MW-4

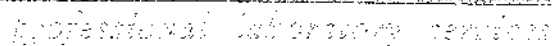
MW-4 is located just west of the electric junction box between tanks #4 and #5. The boring was started at 1:30 pm±. All water used for cleaning split spoons and other tools was obtained at the site. A portable tripod rig was used to drive continuous split spoons starting at 1 foot. The first 1 foot were advanced through the frost using an impact drill. All samples were screened for VOC's with a Photovac HL-2000 (10.6 eV lamp, calibrated with 101 ppm Isobutylene). The screening was done in the headspace of the unwarmed sample jars in a warm vehicle. Representative soil samples from each split spoon were stored in clear glass jars and retained by Dufresne-Henry. No analytical soil samples were collected. Total depth of the boring was 16'5" with no refusal. The general geologic column is sandy gravel fill to approximately 5', silty sand to approximately 11', gravelly sand to 15'+, and till to the limit of the boring. Evidence of petroleum contamination was observed between 1' and 12'+. Odors are noted as oily or oily gasoline. Peak PID readings ranged from 3.2 ppm to 1,220 ppm. The water table was encountered at approximately 9'. Installed a 10' long, 1" diameter, hand slotted galvanized steel pipe at 16'. The annular space was backfilled with clean silica sand to 4'. A bentonite seal was installed from 0' - 4'. The top of the pipe is 1.45' above the ground surface and has a threaded cap.

Materials: 10' of 1", hand slotted galvanized steel pipe.
7.5' of 1", solid wall, galvanized steel pipe.
<50 lb of silica sand.
15 lb± of bentonite chips.
3 1" galvanized couplings.
1 1" threaded galvanized cap.

Visitors: Neil Martin, Barre Water Department personnel.
Weather: Variable clouds, occasional flurries, teens am dropping all day, windy.
Off site: 3:35 pm.

APPENDIX F

CONTRACT LABORATORY ANALYTICAL REPORT

[illegible]

Eastern Analytical, Inc. ID: 19992
Client Identification: J+D Barre 4090058
Date Received: 1/13/2000

Enclosed please find the laboratory report for the above identified project. All analyses were subjected to rigorous quality control measures to assure data accuracy. Unless otherwise stated, all holding times, preservation techniques, container types, and sample conditions adhered to EPA Protocol.

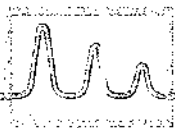
Solid samples are reported on a dry weight basis, unless otherwise noted
 < = "less than" followed by the reporting limit
 TNR = Testing Not Requested
 ND = None Detected, no established detection limit
 RL = Reporting Limits

If you have any questions regarding the results contained within, please feel free to directly contact me, the department supervisor, or the analytical chemist who performed the testing in question. Unless otherwise requested, we will dispose of the sample(s) 30 days from the sample receipt date.

We appreciate this opportunity to be of service and look forward to your continued patronage.

Susan C. Uhler
Susan C. Uhler, Lab Director

1/26/2000
Date



LABORATORY REPORT

Eastern Analytical, Inc. ID#: 19992

Client: Dufresne-Henry

Client Designation: J+D Barre 4090058

Sample ID:	MW-1	MW-2	MW-3	MW-4
Analytical Type:	Sample	Sample	Sample	Sample
Matrix:	aqueous	aqueous	aqueous	aqueous
Date Sampled:	1/12/00	1/12/00	1/12/00	1/12/00
Date Received:	1/13/00	1/13/00	1/13/00	1/13/00
Units:	µg/l	µg/l	µg/l	µg/l
Date of Analysis:	1/22/00	1/22/00	1/24/00	1/24/00
Analyst:	JDS	JDS	JDS	JDS
Method:	8021Bmod	8021Bmod	8021Bmod	8021Bmod
Dilution Factor:	1	1	10	10

Compound	MW-1	MW-2	MW-3	MW-4
Methyl-t-butyl ether(MTBE)	< 10	< 10	< 100	< 100
Benzene	< 1	< 1	10	70
Toluene	< 1	< 1	90	150
Ethylbenzene	< 1	< 1	50	80
mp-Xylene	< 1	< 1	240	440
o-Xylene	< 1	< 1	120	150
1,2,4-Trimethylbenzene	< 1	< 1	240	460
1,3,5-Trimethylbenzene	< 1	< 1	110	170
Naphthalene	< 5	< 5	200	100

8021Bmod: The samples were analyzed by GCMS using method 8260B.

CHAIN-OF-CUSTODY RECORD

Page 1 of 1

REQUESTED ANALYSES

[illegible]

PROJECT MANAGER: Bruce Cox

COMPANY: Extreme-Henry Inc

ADDRESS : _____

CITY: _____ STATE VA ZIP _____

PHONE : () _____ EXT : _____

FAX : _____

E-MAIL: _____

PROJECT NAME: 2nd Base

PROJECT # 4090058

STATE: ☐ NH ☐ MA ☐ ME ☒ VT OTHER _____☐ Site historically contaminated

NOTES : (i.e. Special Detection Limits, Billing Info. if different)

Sheen aboard in
MW-3

RESULTS NEEDED BY

(enter preferred date) : _____

(Guaranteed rapid turnaround needs pre-approval)

QA / QC Reporting Level

☐ A ☐ B ☐ C

Quote # _____

P.O. # _____

Sampler(s) : _____

Reporting Options :

☐ Hard Copy ☐ Fax

Electronic :

☐ E-Mail ☐ Disk

Relinquished by

Date _____

Time

Received by

Relinquished by

Date _____

Time

Received by

Refinanced by

Date _____

Time

Received by

FOR LAB USE ONLY
Adhered to EPA Protocol

☐ Yes ☐ No (see attached)

Cold?
☒ Yes ☐ No